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Avionics Interface Technologies

A615A-LD

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ARINC 615A DA A LOADER

28 DECEMBER 2010

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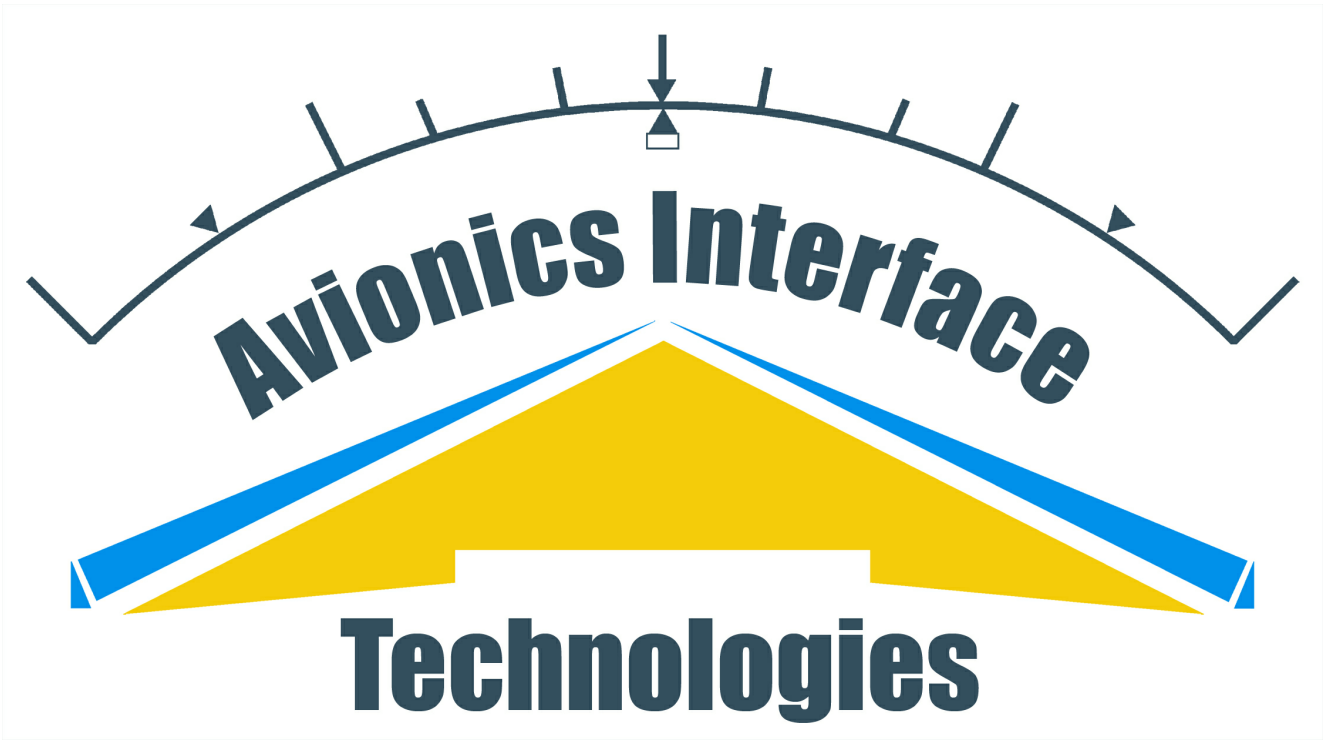

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1 A615A-LDR

Welcome to ***A615A-LDR***, AIT's Target Data Loader Software supporting ARINC Report 615A-1/2 and ARINC Report 665-1/2 operations.

A615A-LDR supports Data Loader operations in conjunction with:

- AIT's AFDX/ARINC664 interface modules for AFDX/ARINC664 networks.
- LAN interface for standard Ethernet networks.

A615A-LDR provides the user with the following capabilities:

- Manually or dynamically **FIND/SNIP Target 'End Systems'**
- Configure Target's ID information, AFDX or Ethernet communications parameters and 615A Data Load protocol plus TFTP protocol characteristics
- **Multiple Data Loader operations** with multiple Target 'End Systems' can be executed simultaneously including
  - **Information Operation** – Recover information on the configuration of the Target Hardware and Loadable Software Airplane parts (i.e. identifiers and Part numbers of the hardware and the software).
  - **Uploading Operation** – Upload data to Target 'End Systems'. Upload source data can reside on the local host or any accessible storage device on the local area network.
  - **Media Defined Download Operation** – Download data from Target 'End Systems' using a pre-defined list of Target file names.
  - **Operator Defined Download Operation** – Request a list of downloadable files from Target 'End Systems' and select the files to download from the list.
- **Log Client/Server communications** during Data Loader Operations
- Automatically creates the LOADS.LUM, FILES.LUM and all header (*.luh) files used for the ARINC615A Upload Operation using the **665-MediaSet Builder** scripting tool.
- Validation of an entire MediaSet including verification of File Exists, numbers, counters, and CRC's.

The ***A615A-LDR*** software is provided with the TFTP Software Library and ARINC615A Data Loader Protocol Library (Windows DLLs) for customer specific applications.

1.1 What's New in this Version

Enhancements to A615A-LDR for **Version 3.10.1**

- The Remote Client Interface has been updated to support Python V2.5.2
- The new INI file setting DuplicateFileNamesAllowed was added to provide support for ARINC665 Files.LUM that include different files of the same filename or not.

2 Associated Documents

Industry Documents

Software Data Loader Using Ethernet Interface ARINC Report 615A-1/2

Loadable Software Standards ARINC Report 665-1/2

RFC 1350 The TFTP Protocol (Revision 2)

3 Getting Started

Getting started with ***A615A-LDR*** involves understanding:

- Requirements of your host system to run A615A-LDR

Defines the system resources required for ***A615A-LDR***.

- Installation

Provides a description of the installation process and a description of the resources installed on your system.

- A615A-LDR Window Overview

Provides an overview of the initial ***A615A-LDR*** displays including menu bars and buttons and status bars.

- Managing License Keys for Data Loader Operations over AFDX or Ethernet

Describes how to enter license keys required for operation.

- A615A-LDR Operation

All ***A615A-LDR*** displays are described in an operationally sequential order.

- 665-MediaSet Builder

All **A615A-LDR *665-Mediaset Builder*** displays are described. The 665-MediaSet Builder is used to automatically create the LOADS.LUM, FILES.LUM and all header (*.luh) files used for the ARINC615A Upload Operation.

3.1 System Requirements

Minimal system requirements for ***A615A-LDR*** are:

- Pentium 450MHz CPU
- 64 MB RAM
- Available Hard disk space for Upload/Download operation
- CD-ROM drive
- Windows 2000/XP
- Access to one of the following:
  - AIM AFDX Interface Module to access the AFDX network installed on the host system or accessible via the AIM Network Server (ANS) with installed Board Support Package and drivers
  - Standard Ethernet Port (using host PC 10BaseT or 100BaseT Ethernet connection) installed on the host system

3.2 Installation

A615A-LDR is available on CD from AIM or via download from our AIMUSA-Online website download area at www.aviftech.com.

In addition to the ***A615A-LDR*** application, the software package includes the following resources:

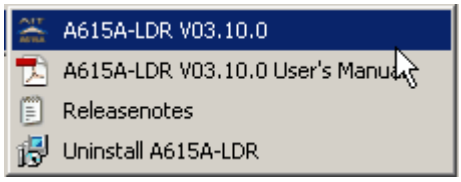
- A615A-LDR User's Manual
- Release Notes
- Sample Target Database.

➢ **To install the *A615A-LDR* software package from the AIT provided CD or a download from www.aviftech.com**

1. If using the AIT provided CD, insert the CD into the CD ROM drive. The Setup Application will automatically start after a few seconds. If the Setup Application does not start after a few seconds, or the software is being installed from an AIT Online download, the Setup Application must be manually started.
   To Start the application manually, navigate to the CD ROM drive or the download directory and double click on the Setup.exe application.

2. Once the Setup Application has started, step through the install wizard to complete the installation.

   The installation will result in the creation of the following shortcuts which can be located by going to **Start | Programs | Avionics Interface Technologies | A615A-LDR V *xxxx***.



➢ **To start *A615A-LDR***

1. Double click on the A615A-LDR icon

installed on your desktop
   or
   Select **Start | All Programs | Avionics Interface Technologies | A615A-LDR V*xxxx* | A615A-LDR**

3.3 Command Line Options

The A615A-LDR Application can be started with command line options which influence the operation of the program.

Syntax:

afdx_lsa.exe [-S<DOS_Script_File>] | [-W[hide | min]]

The following command line options are available:

- **-S**
  This option instructs the application to execute the script (DOS Batch) specified by the <DOS_Script_File>. After this script executes, the application closes immediately.
  Example:
  afdx_lsa.exe -SC:\UPLOAD.bat

- **-W**
  This option specifies the application Window size/placement to be used when the application starts. Two options are available. If the hide options is used, the A615A-LDR application window is hidden and cannot be seen on the desktop when the application is started. If the min option is used, the A615A-LDR application window is available but minimized on the desktop
  when the application starts.
  Example:
  afdx_lsa.exe -Wmin

3.4 A615A-LDR INI File Description

[GLOBAL_OPTIONS] Section:

SocketMode=<0 | 1>
0: Overlapped I/O is used for read operations from Winsock ports. This is the default mode of operation and it is the most efficient

1: Non-overlapped I/O is used for read operations from Winsock ports. This is a low performance mode of operation.

If this section is not present, the Overlapped I/O (0) mode is used by default.

OperationMode=<0 | 1 | 2>
0: Default ARINC664 Operation Mode. The ARINC664 operation mode (Boeing or AFDX) used is determined by the ARINC664 hardware present. If an API/AMC/APM-FDX-2B hardware resource is present, then the Boeing mode will be used. Otherwise, the AFDX mode will be used.

1: AFDX Operation Mode. The AFDX mode of operation is used regardless of the hardware type present

2: Boeing Operation Mode. The Boeing mode of operation is used regardless of the hardware present

If this section is not present, the Default (0) mode of operation is assumed.

[TARGETS] Section:

DEFAULT_DB=<Default TDI File>

<Default TDI File>: Specifies the path to the *.tdi file that is to be loaded when the A615A-LDR application is started.

[LICENSES] Section:

KEY_xx=<Keycode>

xx: Key code index. (Valid values: 01 - 30)

<Keycode>: A615A-LDR hexadecimal license key

[REMOTE_IF] Section:

ENABLE=Y | N
Y: The remote interface is enabled
N: The remote interface is disabled

PORT=<Port>
<Port>: Specifies the UDP port on which the A615A-LDR will listen for connections from the

remote client.

[665Options] Section:

RelFilePtrHandling=665-1 | 665-2

665-1: Specifies that relative file pointers within the 665 media files of the media sets shall be handled as defined in ARINC665-1. That is, the pointer itself is **NOT** counted in the offset.

665-2: Specifies that relative file pointers within the 665 media files of the media sets shall be handled as defined in ARINC665-2. That is, the pointer itself **IS** counted in the offset.

If this section is not present, then the relative file pointer handling mode is determined based on the media set type being processed. That is the **665-1** mode is used on ARINC665-1 media sets and the **665-2** mode is used on ARINC665-2 media sets.

DuplicateFileNamesAllowed=0 | 1
0: Duplicate filenames **ARE NOT** allowed on the media sets. All files listed in FILES. LUM must have unique file names

1: Default value. Duplicate filenames **ARE** allowed on the media sets. Files with the exact same name may exist on the media as long as they are not within the same load.

[ETH_FIND] Section:

DST_IP=<IP Address>
<IP Address>: Specifies the default destination IP address to be placed in the ETH Find dialog. This can be set using the '0x' prefix to specify a Hexadecimal value. Example: 0xFFFFFFFF is IP 255.255.255.255, 0x0A010102 is IP 10.1.1.2. The default setting for this value is 0xFFFFFFFF.

PORT=<Port>
<Port>: Specifies the UDP port on which the A615A-LDR will send the FIND message. The default setting for this value is 1001.

TO=<Timeout>
<Timeout>: Specifies the value (in seconds) for the FIND protocol timeout. If a network client does not respond within this time, it's resource will not be displayed. The default setting for this value is 3.

defaultDLPVersion=1 | 2

1: Specifies that when adding targets discovered using Ethernet FIND the default Data Loader protocol version should be Arinc615A-1.
2: Specifies that when adding targets discovered using Ethernet FIND the default Data Loader protocol version should be Arinc615A-2. This is the default value.

defaultDLPRetryNumber=<Num Retry Attempts>
<Num Retry Attempts>: Specifies the default number of DLP retry attempts when adding targets discovered using Ethernet FIND. The default for this value is 1.

defaultDLPTimeout=<Num Seconds>
<Num Seconds>: Specifies the default DLP timeout value (in seconds) for targets discovered using Ethernet FIND. The default for this value is 13.

defaultTFTPBlockSizeEna=1 | 0

1: Specifies that when adding targets discovered using Ethernet FIND the TFTP block size option is enabled by default.

0: Specifies that when adding targets discovered using Ethernet FIND the TFTP block size option is disabled by default. This is the default option setting.

defaultTFTPFileSizeEna=1 | 0

1: Specifies that when adding targets discovered using Ethernet FIND the TFTP file size option is enabled by default.

0: Specifies that when adding targets discovered using Ethernet FIND the TFTP file size option is disabled by default. This is the default option setting.

defaultTFTPTimeoutEna=1 | 0

1: Specifies that when adding targets discovered using Ethernet FIND the TFTP timeout option is enabled by default.

0: Specifies that when adding targets discovered using Ethernet FIND the TFTP timeout option is disabled by default. This is the default option setting.

defaultTFTPBlockSize=<BlockSize>
<BlockSize>: Specifies the default TFTP block size (in bytes) when adding targets discovered using Ethernet FIND. The default value is 512.

defaultTFTPMaxFileSize=<FileSize>
<FileSize>: Specifies the default TFTP maximum file size (in bytes) when adding targets discovered using Ethernet FIND. The default value is 4096000.

defaultTFTPRetryNumber=<Num Retries>
<Num Retries>: Specifies the default number of TFTP retries when adding targets discovered using Ethernet FIND. The default value is 1.

defaultTFTPT0Timeout=<Num Seconds>
<Num Seconds>: Specifies the default TFTP T0 timeout (in seconds) when adding targets discovered using Ethernet FIND. The default value is 1.

defaultTFTPT1Timeout=<Num Seconds>
<Num Seconds>: Specifies the default TFTP T1 timeout (in seconds) when adding targets discovered using Ethernet FIND. The default value is 0.

defaultTFTPTimeout=<Num Seconds>
<Num Seconds>: Specifies the default TFTP timeout (in seconds) when adding targets discovered using Ethernet FIND. The default value is 1.

defaultTFTPWellKnownPort=<UDP Port>
<UDP Port>: Specifies the default TFTP Well Known Port when adding targets discovered using Ethernet FIND. The default value is 69.

defaultWinSockMinSrcUdp=<UDP Port>
<UDP Port>: Specifies the default minimum UDP src port number to use when adding targets discovered using Ethernet FIND. The default value is 5000.

defaultWinSockMaxSrcUdp=<UDP Port>
<UDP Port>: Specifies the default maximum UDP src port number to use when adding targets discovered using Ethernet FIND. The default value is 6000.

[UPLOAD_OP]

IgnoreErrorsIfPossible=1 | 0

1: When non-fatal errors are detected in the media, they will be ignored.

0: When non-fatal errors are detected in the media, the user will be prompted as to whether or not the errors should be ignored. This is the default value.

Default_Media_Dir =<Media_Dir_Path>
<Media_Dir_Path>: Specifies the default directory to search for Upload Media Sets and Loadable Software Parts.

[MDOWNLOAD_OP]

Default_Dest_Dir=<Dest_Dir_Path>
<Dest_Dir_Path>: Specifies the default directory to search for Media Defined Download destination directories.

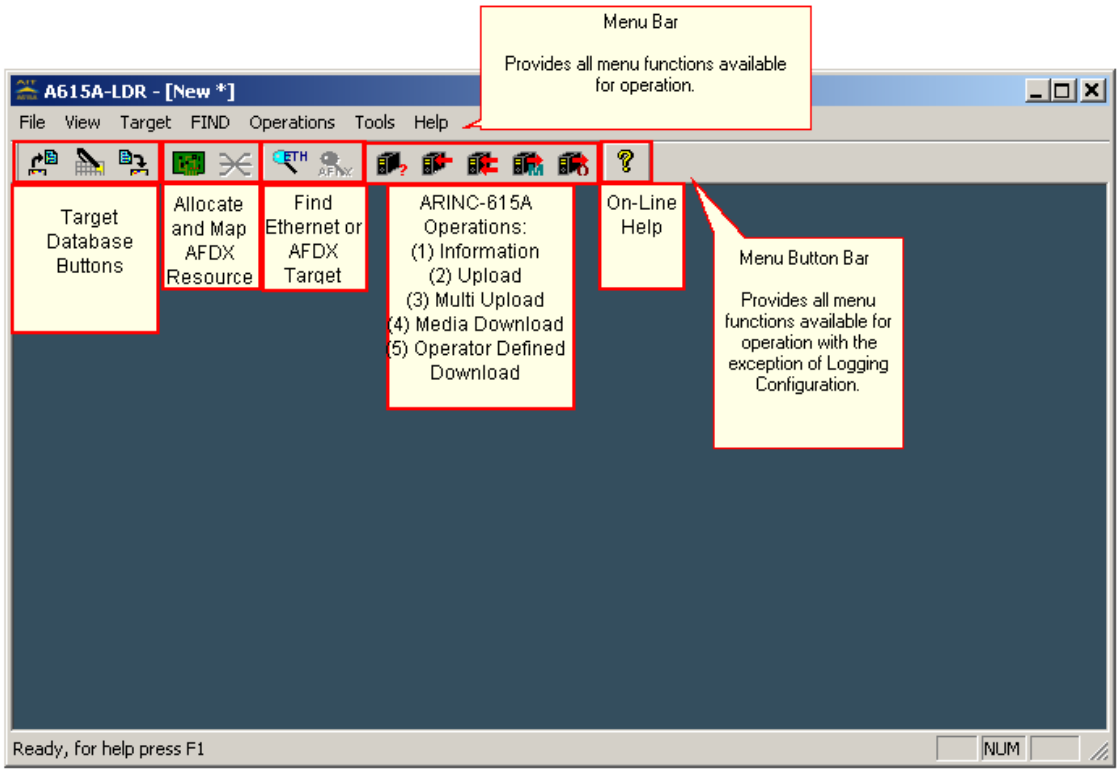
[OPDOWNLOAD_OP]

Default_Dest_Dir=<Dest_Dir_Path>
<Dest_Dir_Path>: Specifies the default directory to search for Operator Defined Download destination directories.

3.5 A615A-LDR Window Overview

The ***A615A-LDR* Main Window Layout** is shown below. ***A615A-LDR*** initialization includes a search for AIM AFDX/ARINC664 interface modules installed on your system. All AFDX/ARINC664 interface modules found are available for Data Loader operations. If no modules are found a message box will appear indicating "No AFDX Resources Found".

***Note**: Some Menu Button Bars will be greyed (unavailable) until certain operations have taken place, such as Loading a Target Database or Mapping your AFDX resources, as defined in the Table below.*


Menu Bar
Provides all menu functions available for operation.
A615A-LDR - [New *]
File View Target FIND Operations Tools Help
Target Database Buttons
Allocate and Map AFDX Resource
Find Ethernet or AFDX Target
ARINC-615A Operations:
(1) Information
(2) Upload
(3) Multi Upload
(4) Media Download
(5) Operator Defined Download
On-Line Help
Menu Button Bar
Provides all menu functions available for operation with the exception of Logging Configuration.
Ready, for help press F1
NUM

The Menu Buttons described in the following table are made available to provide "One-Click" access to often used dialog boxes and are listed as follows:

Icon	Action	Description
	Open Target Database	Allows the user to open a Target Database. (*.tdi) ***Note**: A sample Target Database (`TargetTestDBase.tdi`) is provided in the installed software package in `Program Files\AIT \A615A-LDR Vxx.xx\samples`*
	Edit Target Database	Allows the user to edit the Target Database.
	Save Target Database	Allows the user to save the Target Database. (This button becomes available for use after opening/defining a Target Database.)

Icon	Action	Description
	AFDX Resources	Allows the user to choose the available AFDX/ARINC664 interface module(s) for Data Loader operations and select the speed.
	AFDX Port Mapping	Allows the user to map the AFDX/ARINC664 interface module's port to a Target defined in the Target Database via a logical Portmap. (This button becomes available for use after logging into a AFDX port resource.)
	Ethernet FIND	Using the Target's IP/UDP address, allows the user to generate a FIND/SNIP request over the standard Ethernet port of the host PC to obtain Target ID information. This information can then be used to populate the Target Database.
	AFDX FIND	Using the Target's address quintuplet, allows the user to generate a FIND/SNIP request over the selected AFDX port to obtain Target ID information. This information can then be used to populate the Target Database. This button becomes available for use after logging into your AFDX port resource and mapping the port to a logical portmap.
	Information Operation	Allows the User to perform a 615A Information operation with a defined target. The 615A operation provides information about the configuration of the targets LSAPs. (This button becomes available for use after opening/defining a Target Database.)
	Upload Operation	Allows the user to perform a 615A Upload Operation to a defined Target. Only an ARINC665 compatible load can be chosen for upload. (This button becomes available for use after opening/defining a Target Database.)
	Multi Upload Operation	Allows the user to peform Multiple 615A Upload Operations to multiple Targets via a single Dialog. (This button becomes available for use after opening/defining a Target Database.)
	Media Defined Download Operation	Allows the user to perform a 615A Media Defined Download Operation from a defined Target. (This button becomes available for use after opening/defining a Target Database.)
	Operator Defined Download Operation	Allows the user to perform a 615A Operator Defined Download Operation from a defined Target. (This button becomes available for use after opening/defining a Target Database.)

3.6 Managing License Keys

The **Manage License Keys** dialog provides the user with the capability to easily enter all license keys required to:

- **Operate A615A-LDR using one or more AFDX Interface Module(s) and/or Ethernet**
  A license key is required for each AFDX Interface Module to be used with the A615A-LDR software. These license keys can be easily entered prior to A615A-LDRoperations using the Manage License Keys Dialog.
  ***Note**: The license key used for an AFDX Interface Module to operate with A615A-LDR also allows for Target interface via Ethernet.*

- **Operate A615A-LDR using Ethernet (no AFDX interface allowed)**
  If the user has purchased A615A-LDR for the sole purpose of interfacing via Standard-Ethernet-NIC, then your AIM representative will provide a license key which is based on your MAC-Address.

  ➢ **To determine your MAC Address**

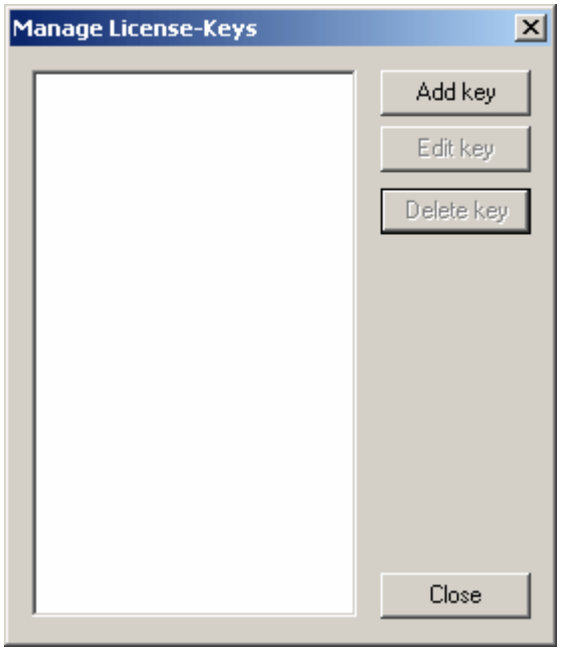
  1. To open a Command Prompt window: Go to **Start | Run** and enter **cmd.exe** or go to **Start | Accessories | Command Prompt**
  2. Type "ipconfig /all" and select Enter
  3. Look for the physical address, this is your MAC-Address!

  or

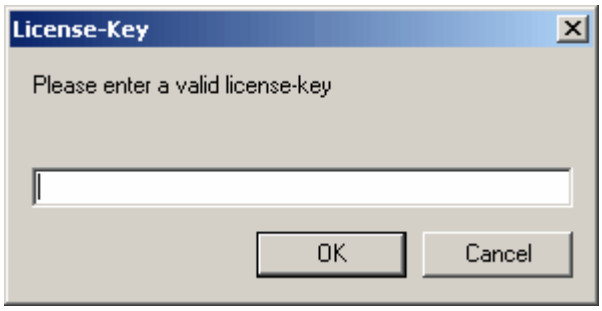
  1. Open a command-line (cmd.exe)
  2. Type "getmac"

  ➢ **To enter the license key for an AFDX Module or to interface via Ethernet**

  1. Select **Help | Licenses**



2. Select the Add button and enter a valid license key. Select OK.



Once the license key has been entered, it is stored in the `afdx_lsa.ini` file, located in

`x:\Program Files\AIT\A615A-LDR Vxx.xx.`

***Note**: If you install a new version of A615A-LDR, you will need to enter all license keys for the AFDX Boards you are using, or simply copy the `afdx_lsa.ini` to the new installed directory.*

4 A615A-LDR Operation

Now that you are familiar with the file menus and menu bars, let's talk about the general order of operation.

1. **Define a Target Database**
   The Target Database (*.tdi) defines the list of Targets which can be used by A615A-LDR Operations.

2. **Link your Source Resource(s) to your Target Resource(s)**
   Once you have defined your Target properties, you must then configure your local resources and map them to the Target.

3. **Perform the ARINC615A Operation**
   A615A-LDR provides the user with four ARINC615A operations:
   - Information Operation
   - Upload Operation
     Note: Prior to the Upload Operation - you may need to build the ARINC665 compatible Upload Files; LOADS.LUM, FILES.LUM and header file (*.luh). If so, use the 665-MediaSet Builder in A615A-LDR.
   - Media Defined Download Operation
   - Operator Defined Download Operation

4.1 Defining a Target Database

The Target Database is an ASCII file (*.tdi extension) that defines the list of Targets which can be used by ***A615A-LDR*** for Information/Upload/Download Operations. The Target Database contains ID information, AFDX or Ethernet Communication parameters and 615A Data Load protocol (DLP) plus TFTP protocol characteristics.

A sample Target Database (`TargetTestDBase.tdi`) is provided in the installed software package in:

`Program Files\AIT\A615A-LDR V`*`xx.xx`*`\samples`

For initial use, you may open this file, edit as needed and save the Target Database using your own application-unique name.

The Target Database can be populated as follows:

1. Open an existing Target Database (or skip this step to create a new Target Database)
2. Create/Edit Target Database
3. Save Target Database

The following information is contained in the Target Database:

Target Database Tab	**Target Property** **Information Available with AFDX FIND / Ethernet FIND
Target ID **Target ID**	Target Name** Target Hardware Identifier** Manufacturer Code** Target Type** Target Position**
Connection **Connection**	For an **Ethernet** transfer: Destination IP Minimum UDP Port Maximum UDP Port For an **AFDX/ARINC664** transfer: Loader-to-Target: Source MAC ID Virtual Link (VL) ID and BAG Source IP address Destination IP address Minimum UDP Port Maximum UDP Port Target-to-Loader Virtual Link (VL) ID Destination IP address AFDX Portmap ID
DLP **Data Load Protocol Options**	Retry Number Timeout Data Load Protocol Version (615-1 or 615-2)

TFTP **TFTP Negotiated /Static Options**	Block Size (enable/disable) Maximum File Size (enable/disable) Timeout (enable/disable) T0 Timeout T2 Timeout Retry Number Well Known Port number Port Option Dally Avoidance

4.1.1 Open Target Database

The following instructions describe the processes involved in opening an existing Target Database.

- **To open an existing Target Database**

1. Select **File | Open Target Database** or the Open Target Database button.
2. Select your previously saved Target database or select the default **TargetTestDBase.tdi**.
3. Select the **Open** button.
   The selected Target Database is now open and available for editing.

OR

- **To instruct A615A-LDR to automatically open an existing Target Database at startup**

1. In any Text Editor, open the A615A-LDR, INI file (afdx_lsa.ini).
2. Add the following to the INI file:
   [TARGETS]
   DEFAULT_DB = **<Path to TDI File>**

   where **<Path to TDI File>** is the full pathname to the Target Database file which is to be automatically loaded at startup.
3. Save the changes to the INI file and close the Text Editor.
4. Shutdown and re-launch the A615A-LDR application.

4.1.2 Create/Edit a Target Database

The following instructions describe the processes involved in creating/editing a Target Database.

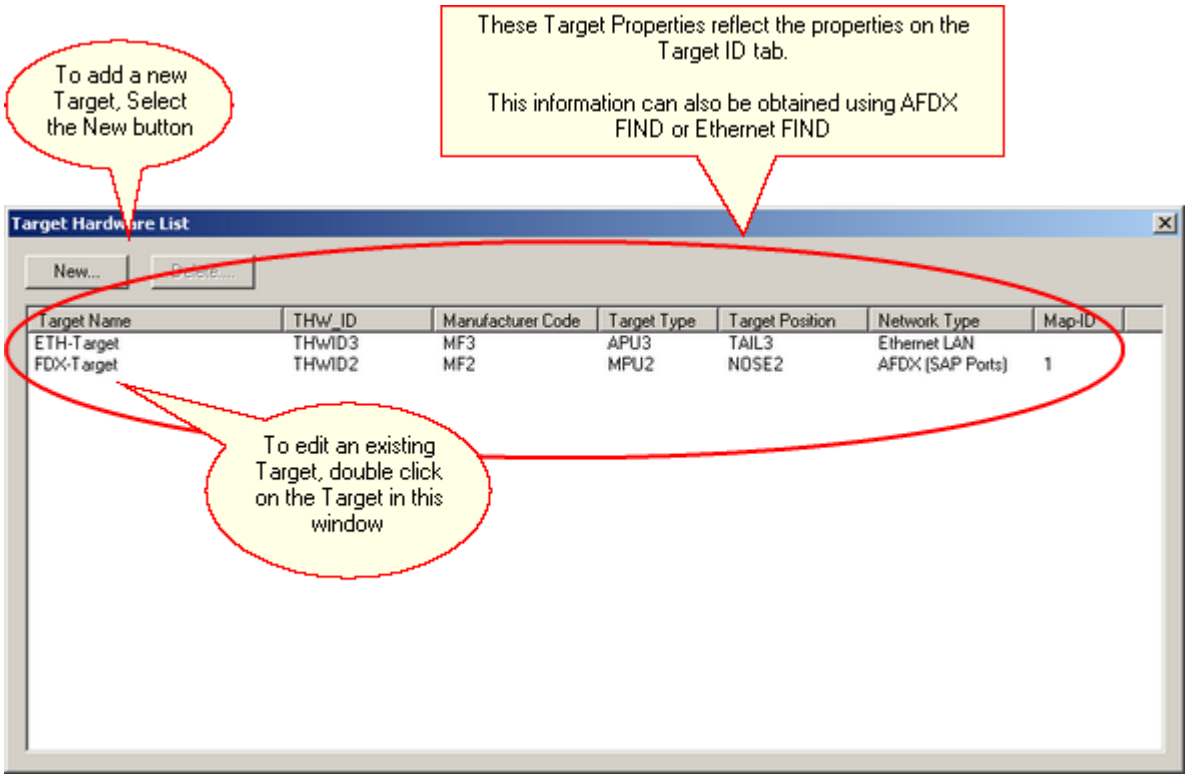
***Note**: While the Target Database is being edited, all other **A615A-LDR** operations are not allowed.*

➢ **To create/edit a Target Database**

1. Select **Target | View/Edit Targets** or the Edit Target Database button.

   If a Target Database had previously been opened, the opened Target Database can now be edited, otherwise a blank Target Hardware List window will appear.

   The following window shows the sample Target Database **TargetTestDBase.tdi**.



2. To **enter a new Target**, select the **New** button. To **edit** a Target, **double click on the Target to be edited**.

You can now create/edit the parameters associated with the target including:

- Target Hardware Identification - General Target Parameters and Network Communication Type
- Connection Information - Target Addressing, dependent on Communication Network
- Data Loading Protocol (DLP) parameters - Data Loader Protocol 615A Configuration
- Trivial File Transfer Protocol (TFTP) parameters - TFTP Protocol settings

3. Save change to your Target Database if desired.

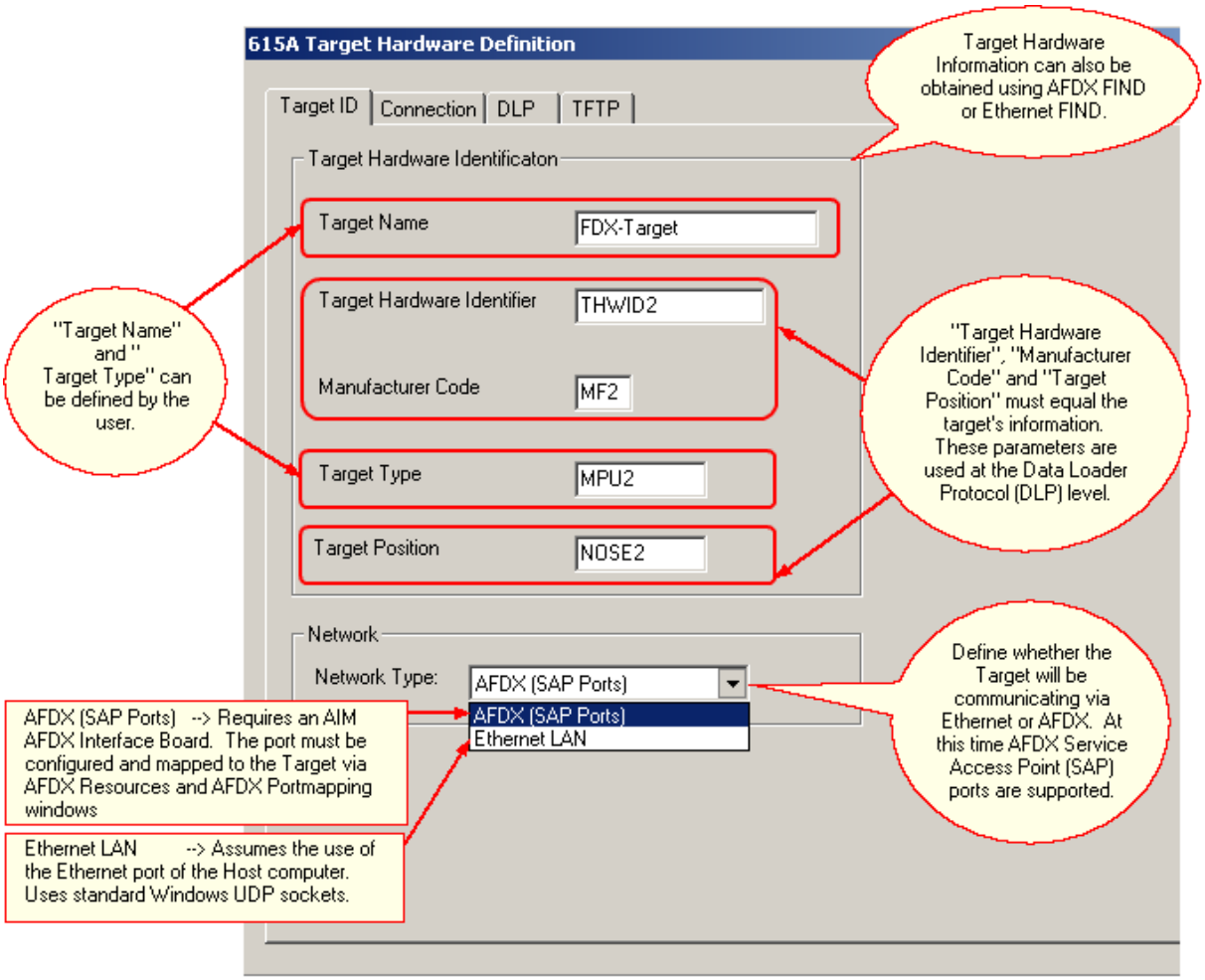
4.1.2.1 Target Hardware Identification

The **Target ID** dialog includes entry for General Target Parameters and Network Communication Type.

If Target Hardware Identification information is unknown, the user can obtain this information prior to creating/editing the Target Database and use the information obtained to populate the Target Hardware ID information:

- Ethernet FIND: For users performing the ARINC-615A operations over the host Ethernet interface
- AFDX FIND: For users performing the ARINC-615A operations over AFDX/ARINC664 interface

The following window represents the Target ID dialog:


615A Target Hardware Definition
Target ID
Connection
DLP
TFTP
Target Hardware Identificaton
Target Name
FDX-Target
Target Hardware Identifier
THWID2
Manufacturer Code
MF2
Target Type
MPU2
Target Position
NOSE2
Network
Network Type:
AFDX (SAP Ports)
AFDX (SAP Ports)
Ethernet LAN
Target Hardware Information can also be obtained using AFDX FIND or Ethernet FIND.
"Target Name" and "Target Type" can be defined by the user.
"Target Hardware Identifier", "Manufacturer Code" and "Target Position" must equal the target's information. These parameters are used at the Data Loader Protocol (DLP) level.
Define whether the Target will be communicating via Ethernet or AFDX. At this time AFDX Service Access Point (SAP) ports are supported.
AFDX (SAP Ports) --> Requires an AIM AFDX Interface Board. The port must be configured and mapped to the Target via AFDX Resources and AFDX Portmapping windows
Ethernet LAN --> Assumes the use of the Ethernet port of the Host computer. Uses standard Windows UDP sockets.

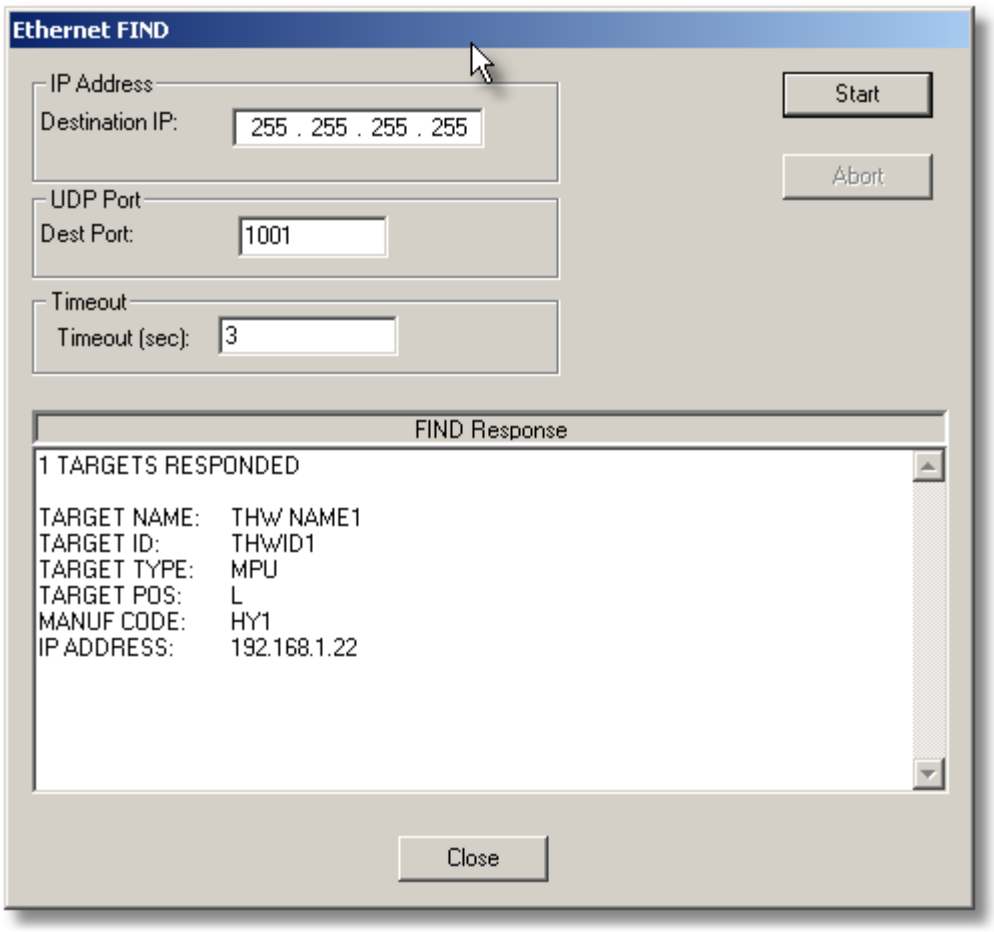
4.1.2.1.1 Ethernet FIND

The **Ethernet FIND** dialog provides the ability to generate a FIND/SNIP Request over Standard Ethernet Port of the Host PC to the corresponding IP address and UDP destination Port. A user definable timeout for the request is supported as well.

➢ **To generate a Ethernet FIND/SNIP Request**

1. Select **FIND | Find ETH Targets** or select the Ethernet FIND button.
2. Enter the **Destination IP/UDP address** to be used in the FIND request message. This may be either a broadcast or unicast IP address.
3. Enter the **timeout** desired for this request.
4. Select **Start**.

If an Ethernet Target with the IP/UDP address entered is listening - it should respond with it's target hardware information in the FIND Response window. This information can then be entered into the Target Database for this target.



4.1.2.1.2 AFDX FIND

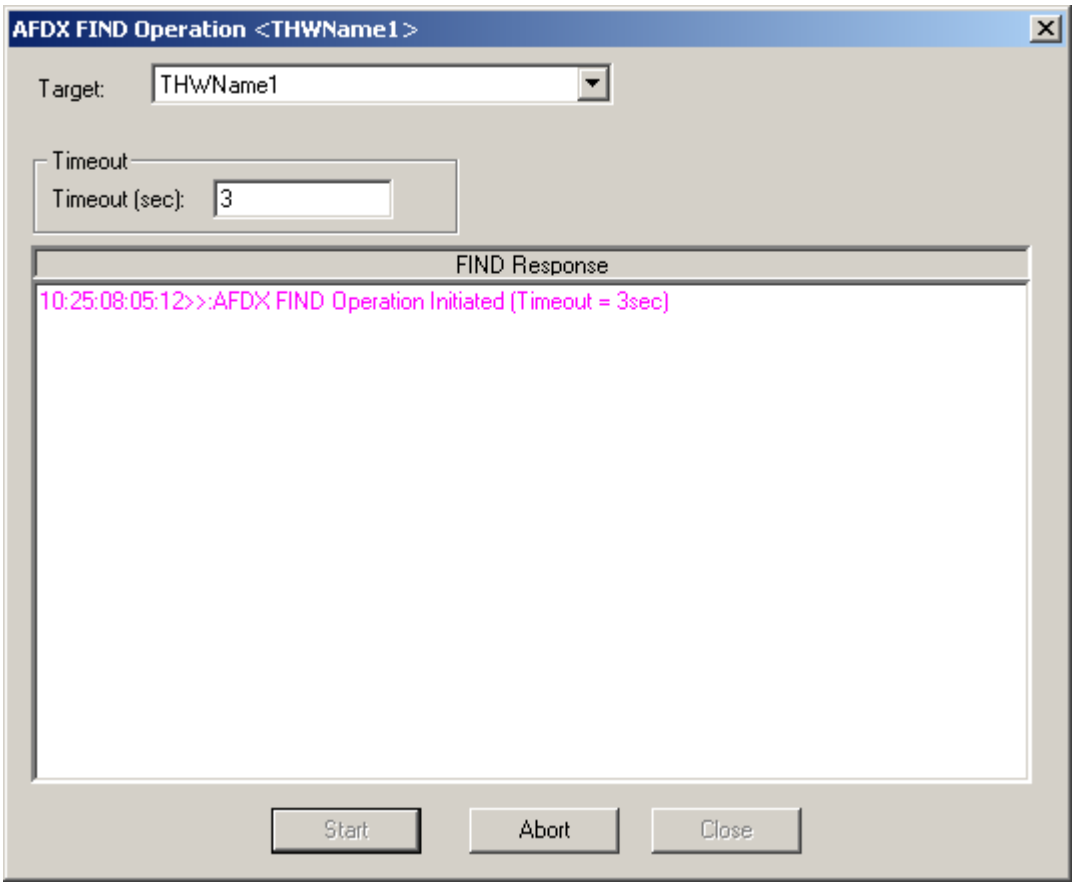
The **AFDX FIND** dialog provides the ability to generate a FIND/SNIP Request over the selected AFDX port to the corresponding MAC address. A user definable timeout for the request is supported as well.

***Note**: This capability becomes available after logging into your AFDX port resource and mapping the port to a logical portmap.*

- **To generate an AFDX FIND/SNIP Request**

1. Select **FIND | Find AFDX Targets** or select the AFDX FIND button.
2. Select the **Target** via the pull-down menu (Target must be defined in the Target Database).
3. Enter the **timeout** desired for this request.
4. Select **Start**.

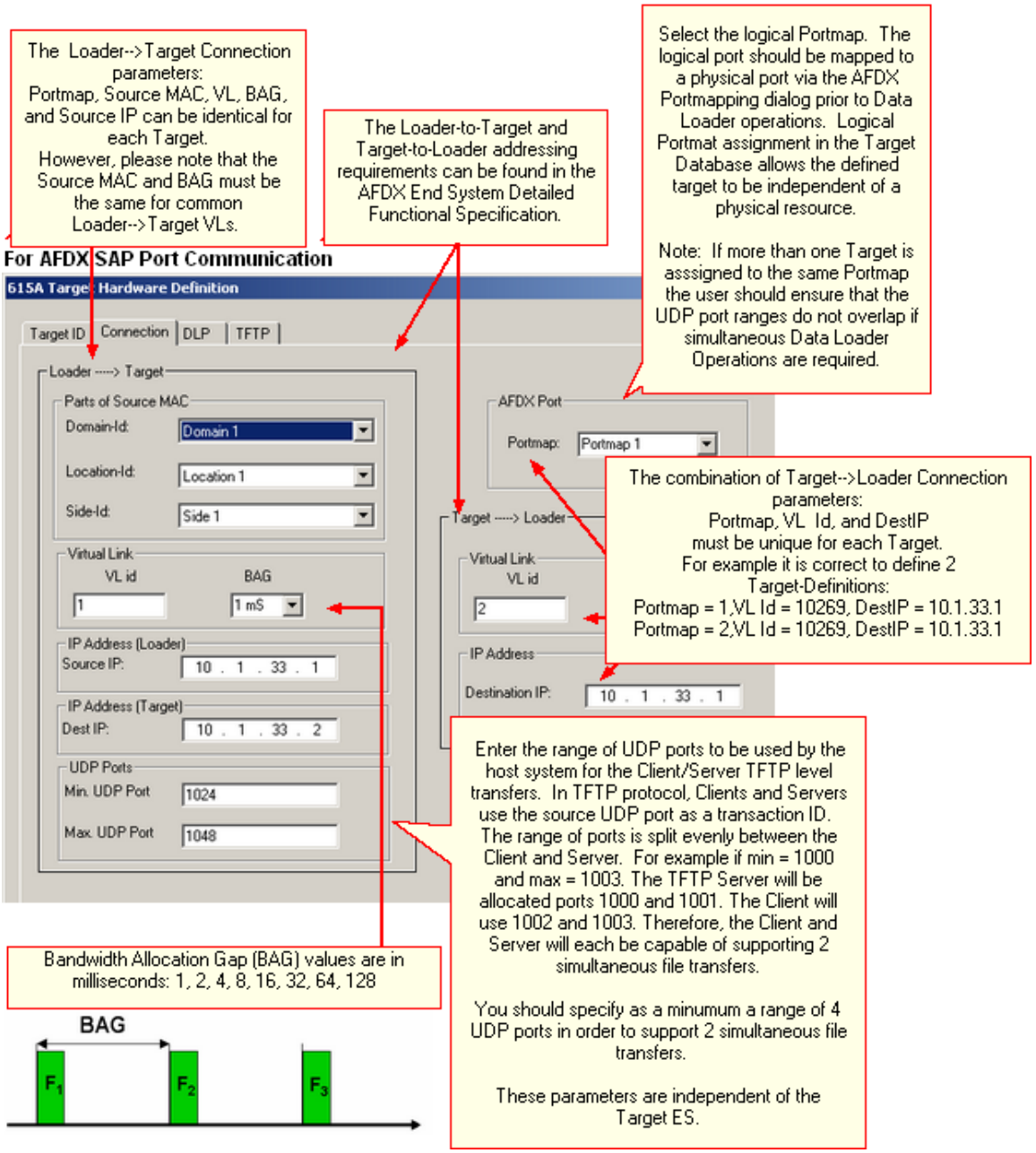
If an AFDX Target is listening - it should respond with it's target hardware information in the FIND Response window as shown below. This information can then be entered into the Target Database for this target.



4.1.2.2 Connection Information

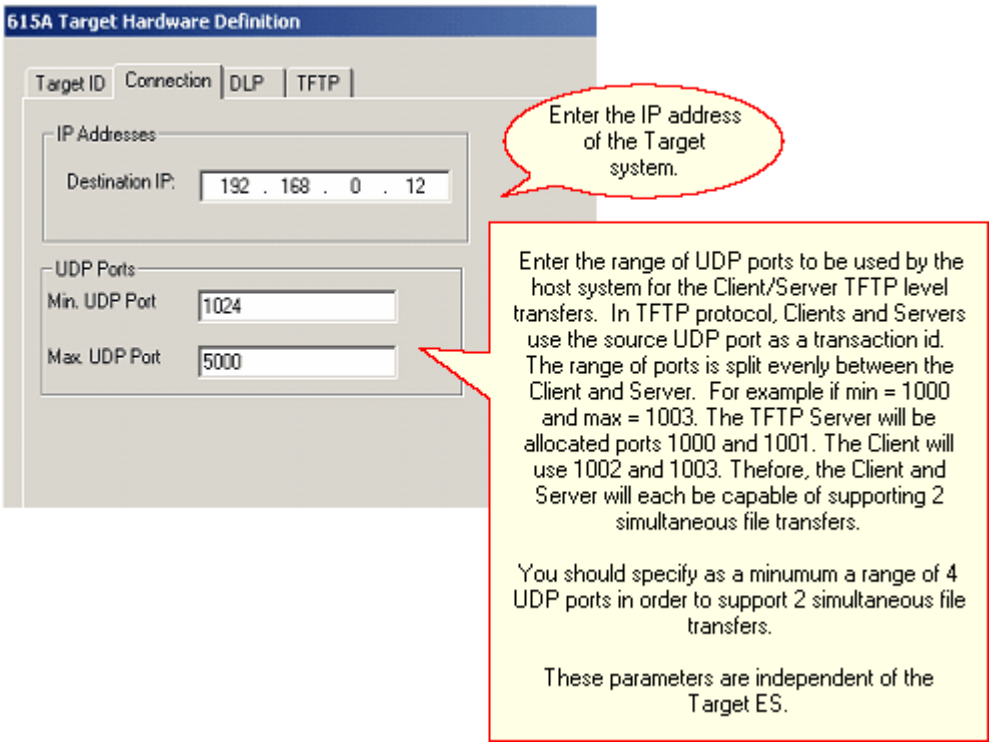
The **Connection** dialog includes entry for Target Addressing. Depending on the Network Type selected in the Target ID dialog, the Connection dialog will vary in appearance and input requirements as follows:

For **AFDX SAP Port Communication** the **Connection** dialog will appear as:


The Loader-->Target Connection parameters:
Portmap, Source MAC, VL, BAG, and Source IP can be identical for each Target.
However, please note that the Source MAC and BAG must be the same for common Loader-->Target VLs.
The Loader-to-Target and Target-to-Loader addressing requirements can be found in the AFDX End System Detailed Functional Specification.
Select the logical Portmap. The logical port should be mapped to a physical port via the AFDX Portmapping dialog prior to Data Loader operations. Logical Portmat assignment in the Target Database allows the defined target to be independent of a physical resource.
Note: If more than one Target is asssigned to the same Portmap the user should ensure that the UDP port ranges do not overlap if simultaneous Data Loader Operations are required.
For AFDX SAP Port Communication
615A Target Hardware Definition
Target ID
Connection
DLP
TFTP
Loader -----> Target
Parts of Source MAC
Domain-Id:
Domain 1
Location-Id:
Location 1
Side-Id:
Side 1
Virtual Link
VL id
BAG
1
1 mS
IP Address (Loader)
Source IP:
10 . 1 . 33 . 1
IP Address (Target)
Dest IP:
10 . 1 . 33 . 2
UDP Ports
Min. UDP Port
1024
Max. UDP Port
1048
AFDX Port
Portmap:
Portmap 1
Target -----> Loader
Virtual Link
VL id
2
IP Address
Destination IP:
10 . 1 . 33 . 1
The combination of Target-->Loader Connection parameters:
Portmap, VL Id, and DestIP
must be unique for each Target.
For example it is correct to define 2 Target-Definitions:
Portmap = 1,VL Id = 10269, DestIP = 10.1.33.1
Portmap = 2,VL Id = 10269, DestIP = 10.1.33.1
Enter the range of UDP ports to be used by the host system for the Client/Server TFTP level transfers. In TFTP protocol, Clients and Servers use the source UDP port as a transaction ID. The range of ports is split evenly between the Client and Server. For example if min = 1000 and max = 1003. The TFTP Server will be allocated ports 1000 and 1001. The Client will use 1002 and 1003. Therefore, the Client and Server will each be capable of supporting 2 simultaneous file transfers.
You should specify as a minumum a range of 4 UDP ports in order to support 2 simultaneous file transfers.
These parameters are independent of the Target ES.
Bandwidth Allocation Gap (BAG) values are in milliseconds: 1, 2, 4, 8, 16, 32, 64, 128
BAG
F1
F2
F3

For **Ethernet LAN Communication** the **Connection** dialog will appear as:

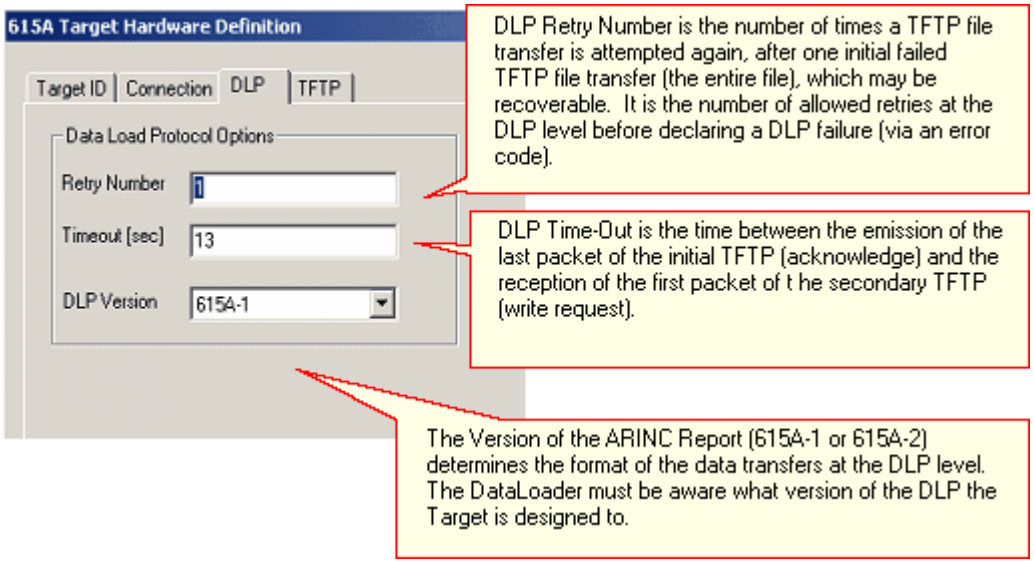
For Ethernet LAN Communication


615A Target Hardware Definition
Target ID
Connection
DLP
TFTP
IP Addresses
Destination IP:
192 . 168 . 0 . 12
UDP Ports
Min. UDP Port
1024
Max. UDP Port
5000
Enter the IP address of the Target system.
Enter the range of UDP ports to be used by the host system for the Client/Server TFTP level transfers. In TFTP protocol, Clients and Servers use the source UDP port as a transaction id. The range of ports is split evenly between the Client and Server. For example if min = 1000 and max = 1003. The TFTP Server will be allocated ports 1000 and 1001. The Client will use 1002 and 1003. Thefore, the Client and Server will each be capable of supporting 2 simultaneous file transfers.
You should specify as a minumum a range of 4 UDP ports in order to support 2 simultaneous file transfers.
These parameters are independent of the Target ES.

4.1.2.3 Data Loading Protocol

The **Data Load Protocol (DLP)** dialog includes entry for DLP options. The DLP layer manages general processes and coordinates activities between the Data Loader and the Target hardware. The DLP layer is activated for each data load operation (upload, download, etc.) for each target hardware, and manages objects corresponding to one TFTP file transfer. The DLP layer has no knowledge of the TFTP exchanges.

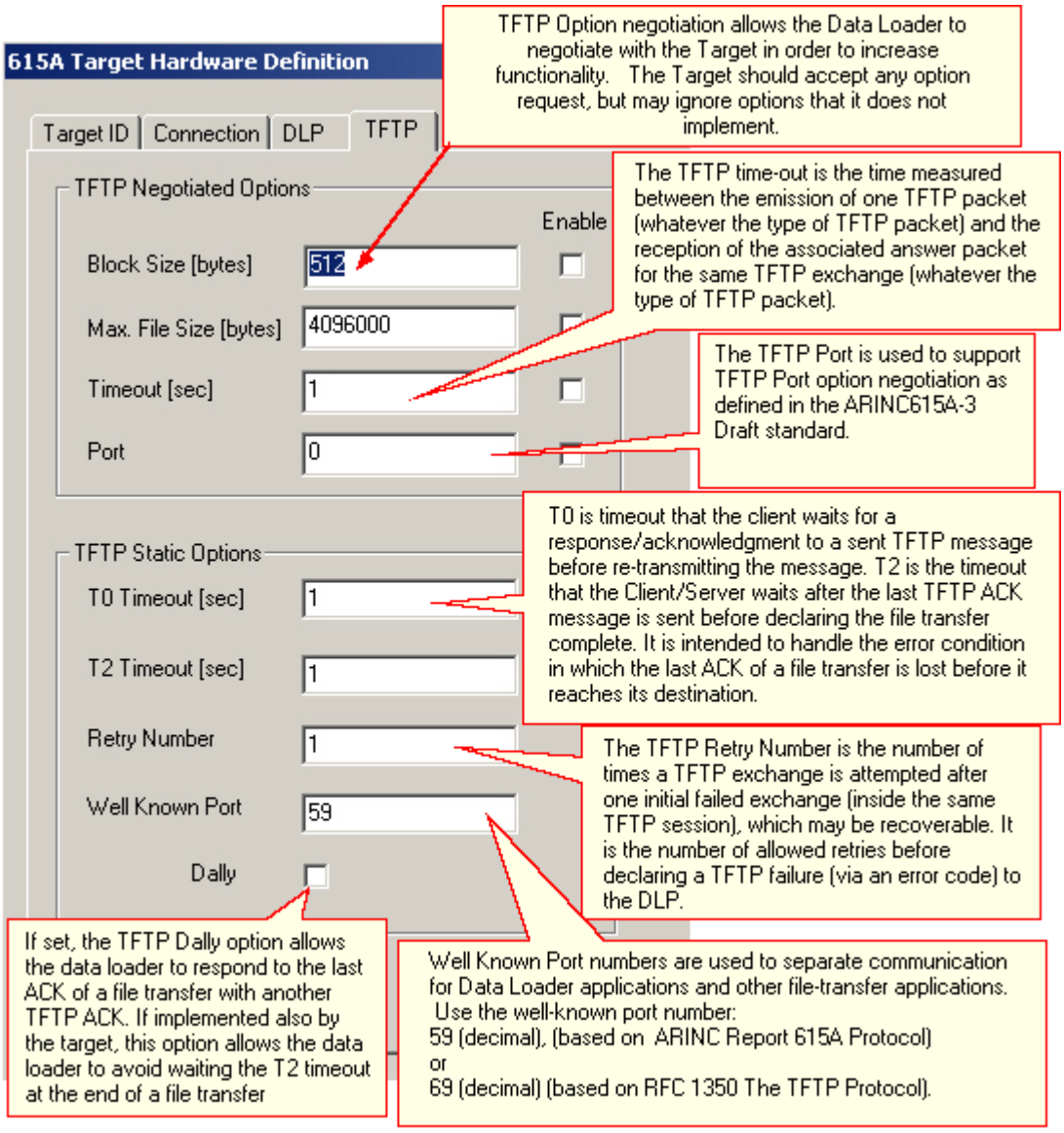
The **DLP** dialog is shown below:


615A Target Hardware Definition
Target ID
Connection
DLP
TFTP
Data Load Protocol Options
Retry Number
1
Timeout [sec]
13
DLP Version
615A-1
DLP Retry Number is the number of times a TFTP file transfer is attempted again, after one initial failed TFTP file transfer (the entire file), which may be recoverable. It is the number of allowed retries at the DLP level before declaring a DLP failure (via an error code).
DLP Time-Out is the time between the emission of the last packet of the initial TFTP (acknowledge) and the reception of the first packet of t he secondary TFTP (write request).
The Version of the ARINC Report (615A-1 or 615A-2) determines the format of the data transfers at the DLP level. The DataLoader must be aware what version of the DLP the Target is designed to.

4.1.2.4 Trivial File Transfer Protocol

The **Trivial File Transfer Protocol (TFTP)** dialog includes entry for TFTP options. The TFTP Layer supports file transfers (protocol files and data files). This layer defines one exchange by one request and its answer (regardless of the type of packet).

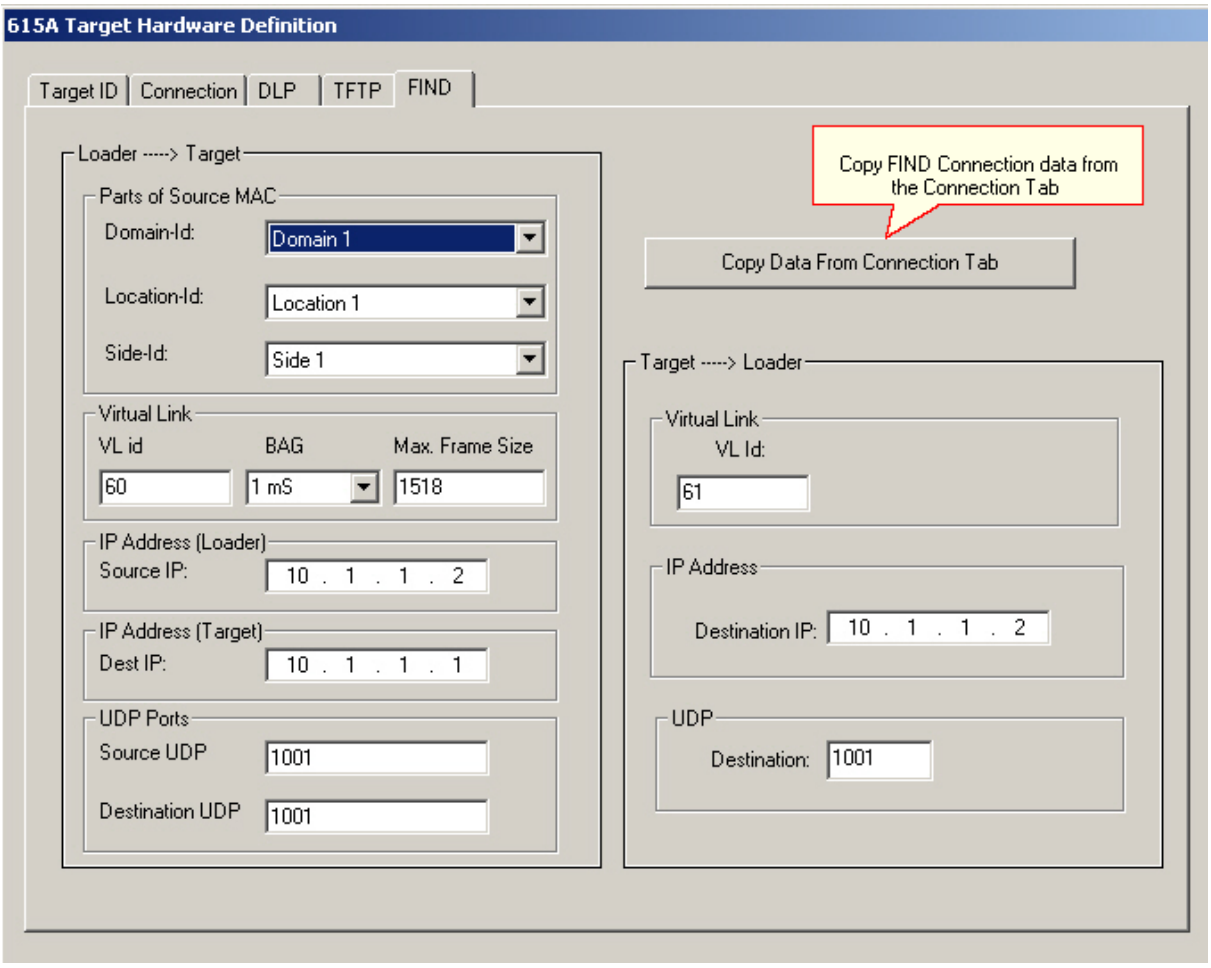
The **TFTP** dialog is shown below:


615A Target Hardware Definition
Target ID
Connection
DLP
TFTP
TFTP Option negotiation allows the Data Loader to negotiate with the Target in order to increase functionality. The Target should accept any option request, but may ignore options that it does not implement.
TFTP Negotiated Options
Enable
Block Size [bytes]
512
Max. File Size [bytes]
4096000
Timeout [sec]
1
Port
0
The TFTP time-out is the time measured between the emission of one TFTP packet (whatever the type of TFTP packet) and the reception of the associated answer packet for the same TFTP exchange (whatever the type of TFTP packet).
The TFTP Port is used to support TFTP Port option negotiation as defined in the ARINC615A-3 Draft standard.
TFTP Static Options
T0 Timeout [sec]
1
T2 Timeout [sec]
1
Retry Number
1
Well Known Port
59
Dally
T0 is timeout that the client waits for a response/acknowledgment to a sent TFTP message before re-transmitting the message. T2 is the timeout that the Client/Server waits after the last TFTP ACK message is sent before declaring the file transfer complete. It is intended to handle the error condition in which the last ACK of a file transfer is lost before it reaches its destination.
The TFTP Retry Number is the number of times a TFTP exchange is attempted after one initial failed exchange (inside the same TFTP session), which may be recoverable. It is the number of allowed retries before declaring a TFTP failure (via an error code) to the DLP.
If set, the TFTP Dally option allows the data loader to respond to the last ACK of a file transfer with another TFTP ACK. If implemented also by the target, this option allows the data loader to avoid waiting the T2 timeout at the end of a file transfer
Well Known Port numbers are used to separate communication for Data Loader applications and other file-transfer applications.
Use the well-known port number:
59 (decimal), (based on ARINC Report 615A Protocol)
or
69 (decimal) (based on RFC 1350 The TFTP Protocol).

4.1.2.5 Find Information

The **Find** tab includes entry for Target Addressing to be used for execution of the AFDX Find Operation. The Find tab will only be displayed in the **615A Target Hardware Definition** dialog when the network type AFDX (SAP Ports) is selected in the Target ID tab.

The Find tab is used to enter connection data that is used for communications with the AFDX Target when executing the AFDX Find Operation. In most cases, this will be the same information as entered in the Connection tab. To avoid re-entering the same data, the **Copy Data From Connection Tab** button may be used.



4.1.3 Save Target Database

Once you have created/edited your Target Database, you may choose to save your changes. The following instructions describe the processes involved in saving a Target Database.

- **To save a Target Database**

1. To save with the same name, select **File | Save Target Database** or the Save Target Database button.

   or

   To save with a new name, select **File | Save Target Database As** and enter a new name for the Target Database.

   The target database will be saved with the file extension `*.tdi`

4.2 Linking Source Resources to Target Resources

To communicate to the Target 'End System' via an AFDX/ARINC664 interface, there are two steps that you must first perform:

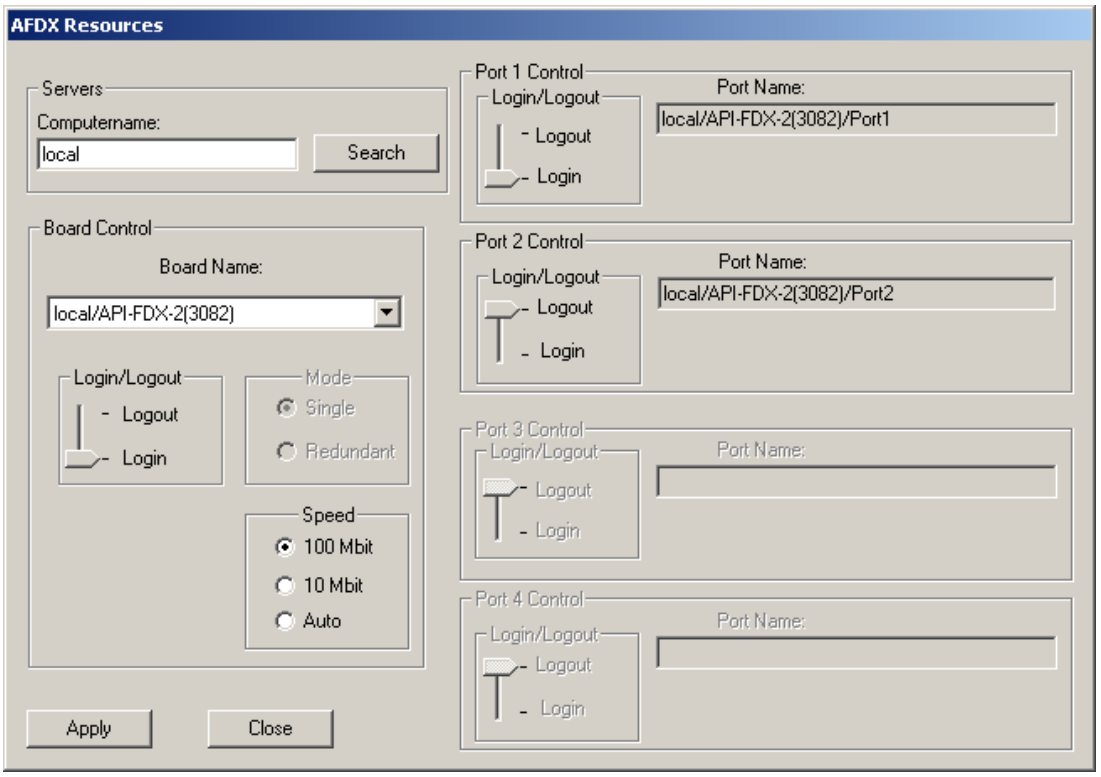
1. Configure your AFDX board/Port.
2. Map your physical AFDX Port to the Logical Portmap assigned to the Target.

4.2.1 AFDX Resources

The **AFDX Resources** dialog allows you to Login to the AIM AFDX board(s)/port(s) and configure the speed of the port(s). This step must be performed prior to any Data Loader operations that involve an interface to a Target via AFDX.

➢ **To configure your AFDX/ARINC664 Board/Port Resource**

1. Select **View | AFDX Resources** or select the AFDX Resources button.
   The AFDX Resources dialog will appear. If AFDX resources were previously found when A615A-LDR was started, they will appear in the list of Boards in the Board pull down menu. If no AFDX resources were found, the board and port entries will be greyed out.

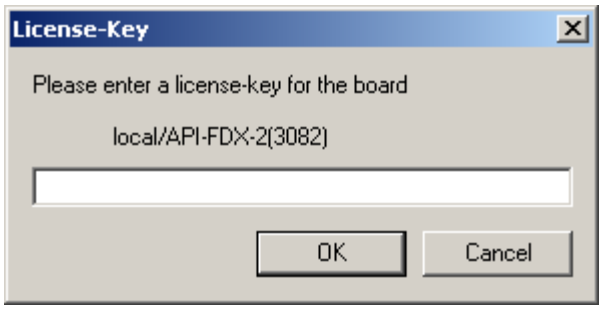


2. If you would like to use AFDX resources on a server connected to your Local Area Network (LAN) enter the **IP address** or **name of the computer** hosting the AFDX boards and select **Search**.
   The found AFDX resources should appear now in the Board pull down menu under the Board Control entry on the dialog.

   ***Note**: It is not possible to use local and remote AFDX boards simultaneously. Also, it is not possible to use boards of different servers simultaneously.*

3. Select the **Board** you would like to Login to using the pull-down menu.
4. **Login to the Board** using the slider bar.

   If you have not entered the license key for this AFDX board before, you will be asked to enter the license-key in order to use the AFDX interfaface module with A615A-LDR.



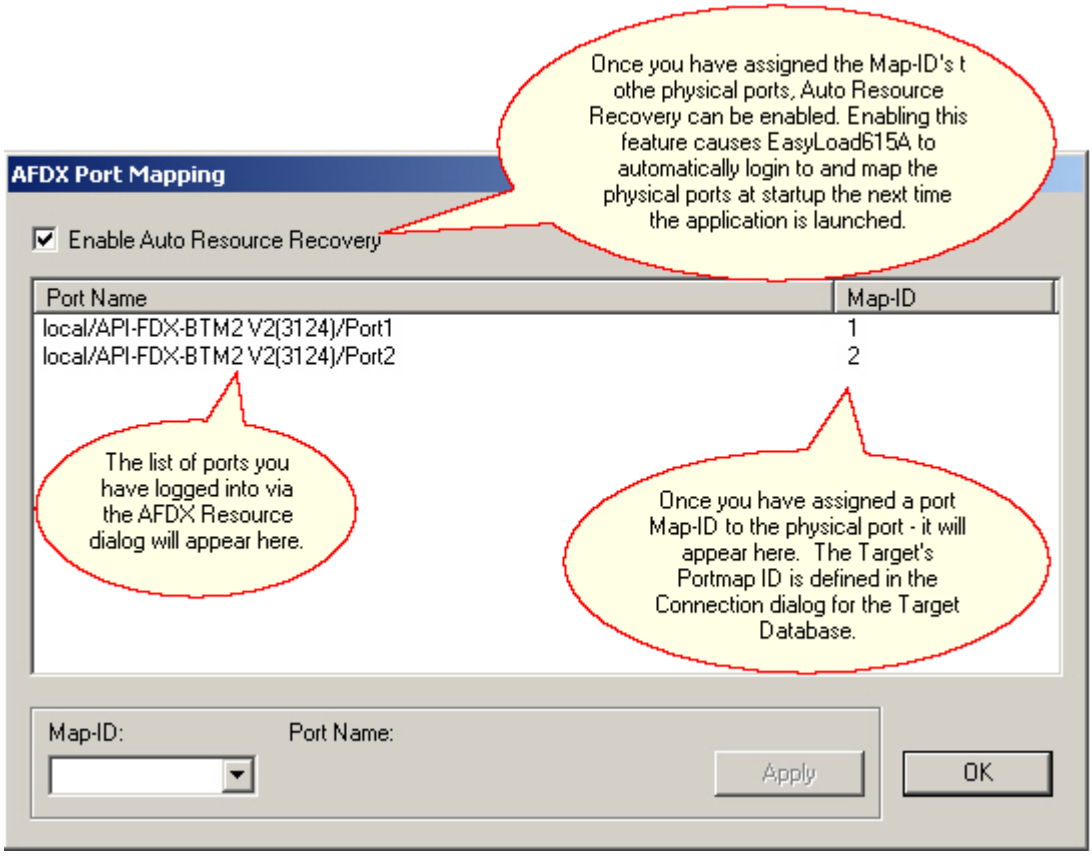
5. Enter the **license-key** and select **OK**
   Once the license key has been entered, it is stored in the `afdx_lsa.ini` file, located in
   `x:\Program Files\AIT\A615A-LDR Vxx.xx.`
   ***Note**: If you install a new version of A615A-LDR, you will need to enter all license keys for the AFDX Boards you are using, or simply copy the `afdx_lsa.ini` to the new installed directory.*
6. Select Board **speed** (both ports must operate at the same speed).
7. Select Single (each port operates independently) or redundant (Port 2 is configured to transmit the same data as Port 1).
8. **Login to port(s)** to be used for the Data Loader operation(s). (If the board is in Redundant mode, you can only perform a Login to Port 1.)
9. Select **Apply**.

4.2.2 AFDX Portmapping

The **AFDX Portmapping** dialog allows you to assign a physical AFDX Port resource to a logical Portmap. The logical Portmap is the parameter configured for each Target via the Target Database Connection window. The logical portmapping provides the user with the capability to easily reassign a physical port to a logical portmap used for a particular target's data load operations. A defined AFDX Target in the Target Database is able to perform Data Loader Operations (Information, Upload and Download), only if the associated portmap has been assigned to a physical AFDX port.

➢ **To map your AFDX/ARINC664 Board/Port Resource to a logical Portmap used in the Target DB**

1. Select **View | AFDX Port Mapping** or select the AFDX Port Mapping button. The list of AFDX Port Resources to which you have logged in are listed on the left.
2. Select an **AFDX Port Resource** from the left list under Port Name.
3. Choose a **Map_ID** from the pick list.
4. Select **Apply**.


Once you have assigned the Map-ID's t othe physical ports, Auto Resource Recovery can be enabled. Enabling this feature causes EasyLoad615A to automatically login to and map the physical ports at startup the next time the application is launched.
AFDX Port Mapping
Enable Auto Resource Recovery
Port Name
Map-ID
local/API-FDX-BTM2 V2(3124)/Port1
1
local/API-FDX-BTM2 V2(3124)/Port2
2
The list of ports you have logged into via the AFDX Resource dialog will appear here.
Once you have assigned a port Map-ID to the physical port - it will appear here. The Target's Portmap ID is defined in the Connection dialog for the Target Database.
Map-ID:
Port Name:
Apply
OK

4.3 Perform ARINC615A Operations

All Data Loader operations supported by **A615A-LDR** can be performed simultaneously with multiple Target 'End Systems'.

***Note**: Multiple Targets can be supported over the same port (Portmap), but the user must ensure that the UDP port ranges defined in the Target Database for the Target's Connections do not overlap. Each Target can only support one operation at a time (as defined in ARINC615A-1/2 Reports).*

Once you have defined your Target in the Target Database, configured and mapped the physical port to the logical port assigned to the Target, you can perform the following ARINC615A Data Loader Operations:

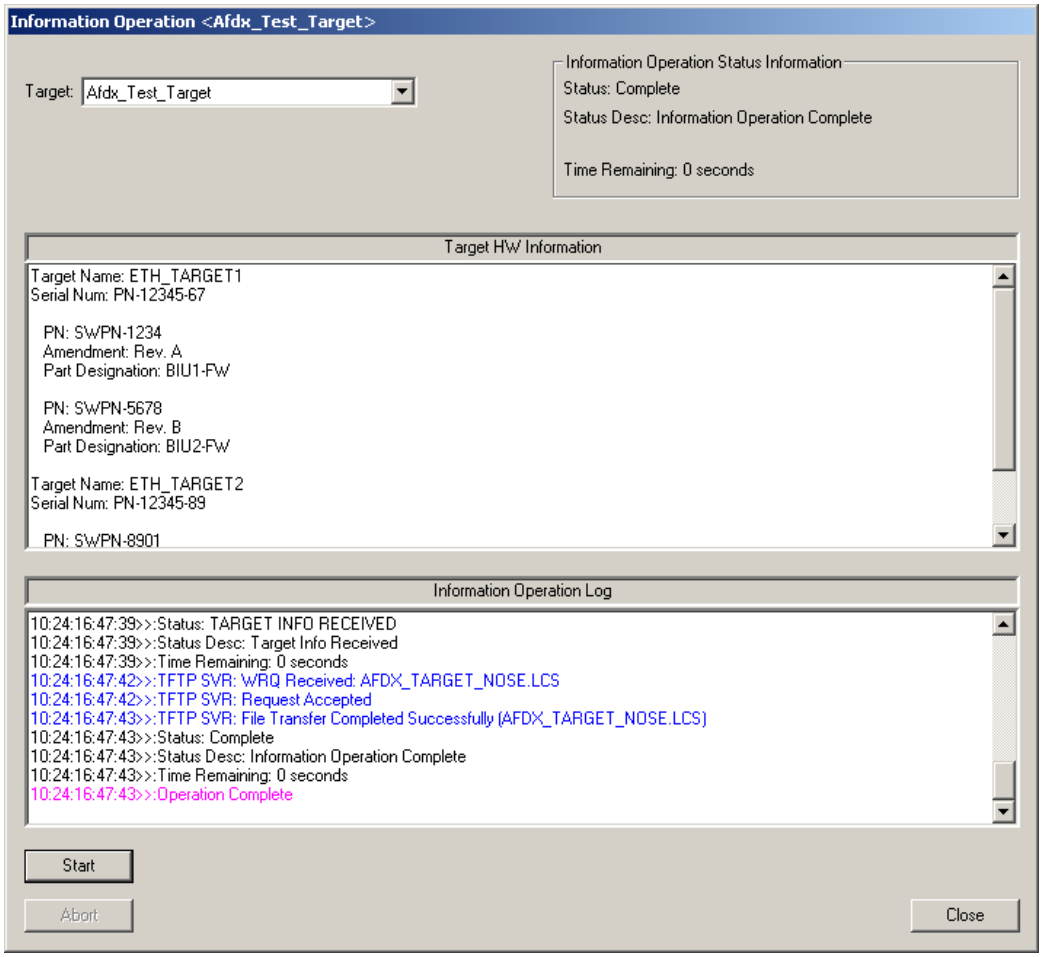
- **Information Operation**
- **Upload Operation**
- **Media Defined Download Operation**
- **Operator Defined Download Operation**

4.3.1 Information Operation

The **Information Operation** allows you to recover information on the configuration of the Target Hardware and Loadable Software Airplane parts (i.e. identifiers and Part numbers of the hardware and the software).

➢ **To perform an Information Operation with a Target**

1. Select **Operations | Information** or select the Information Operation button.
2. Select the **Target** via the pull-down menu (Target must be defined in the Target Database).
3. Select **Start.**
   The status of the Information Operation is shown in the Information Operation Status window. If the Information Operation is successful, the Target Information is retrieved and shown in the Target HW Information window as shown below.
4. If desired, select **Abort** to stop the Information Operation.



4.3.2 Upload Operation

The **Upload Operation** allows you to upload ARINC665 compatible files from the Data Loader to the Target Hardware. Upload source files can reside on the local host or any accessible storage device on the local area network.

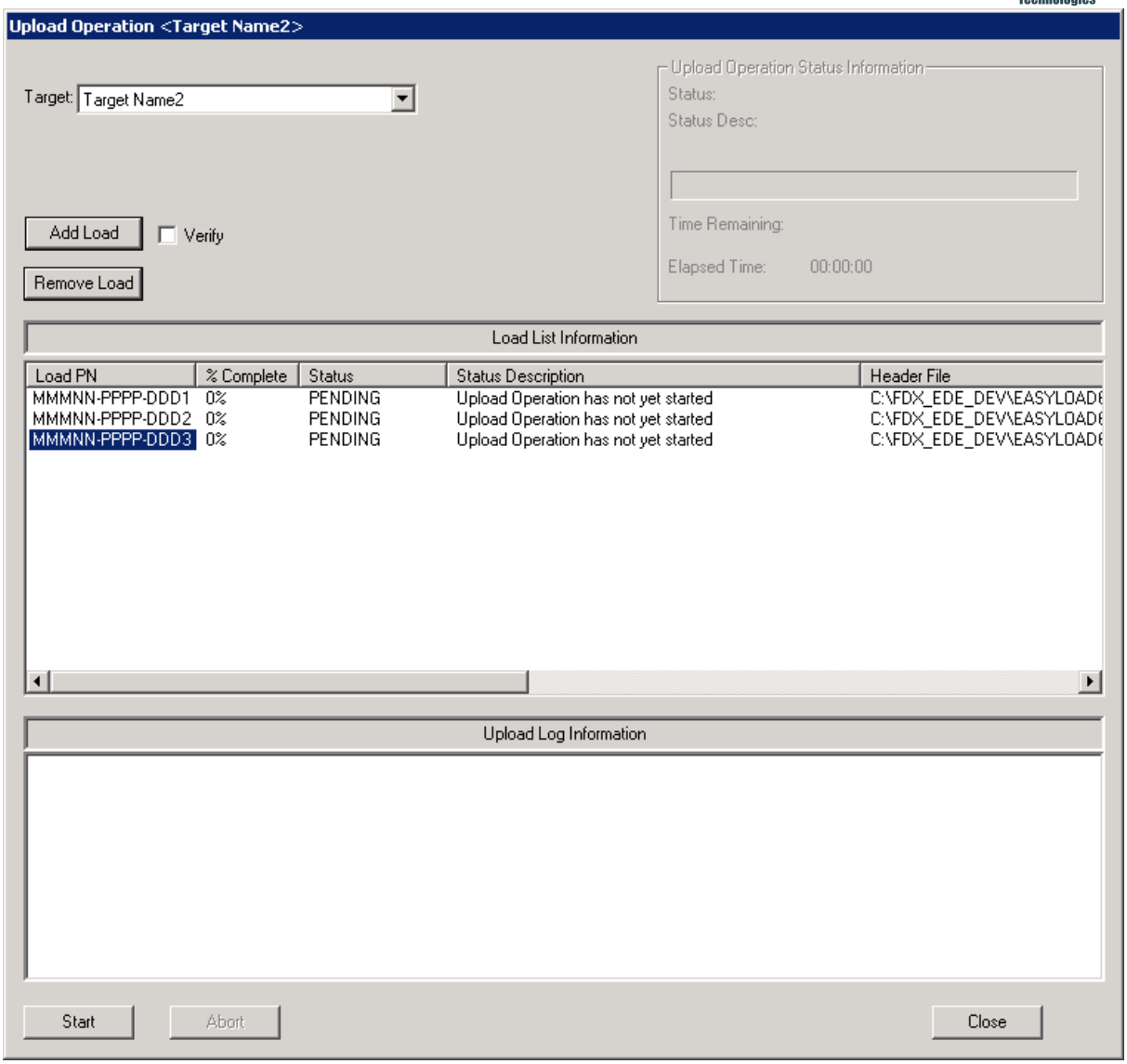
***Note**: To build the ARINC665 compatible Upload Files; LOADS.LUM, FILES.LUM and header file (*.luh), use the 665-MediaSet Builder in A615A-LDR.*

- **To Upload files to a Target**

1. Select **Operations | Upload** or select the Upload Operation button
2. Select the **Target** via the pull-down menu (Target must be defined in the Target Database)
3. Select the **Add Load** button to browse to the media (i.e. CD, floppy, directory) which contains the ARINC665 compatible LOADS.LUM and FILES.LUM, or any ARINC665 compatible load header (*.LUH) defining a load(s) to be added to the load session.

   After the LOADS.LUM, or load header file is selected, if the **Verify** check box is selected, the MediaSet will be verified/validated by A615A-LDR, if an error is found the validation will be aborted and the error/problem will be shown. If the MediaSet can be loaded anyway (maybe only a CRC was not correct), A615A-LDR will ask if the MediaSet should be used although a problem was found. If no errors occurred the "Load List Information" window will list all Header Files (as defined in the associated FILES.LUM file) associated with this load.

4. Select **Start** to start the Upload Operation
5. The status of the Upload Operation is shown in the Upload Operation Status Information window and the status of each header file associated with this load is shown in the Load List Information window.
6. If desired, select **Abort** to stop the Upload operation.



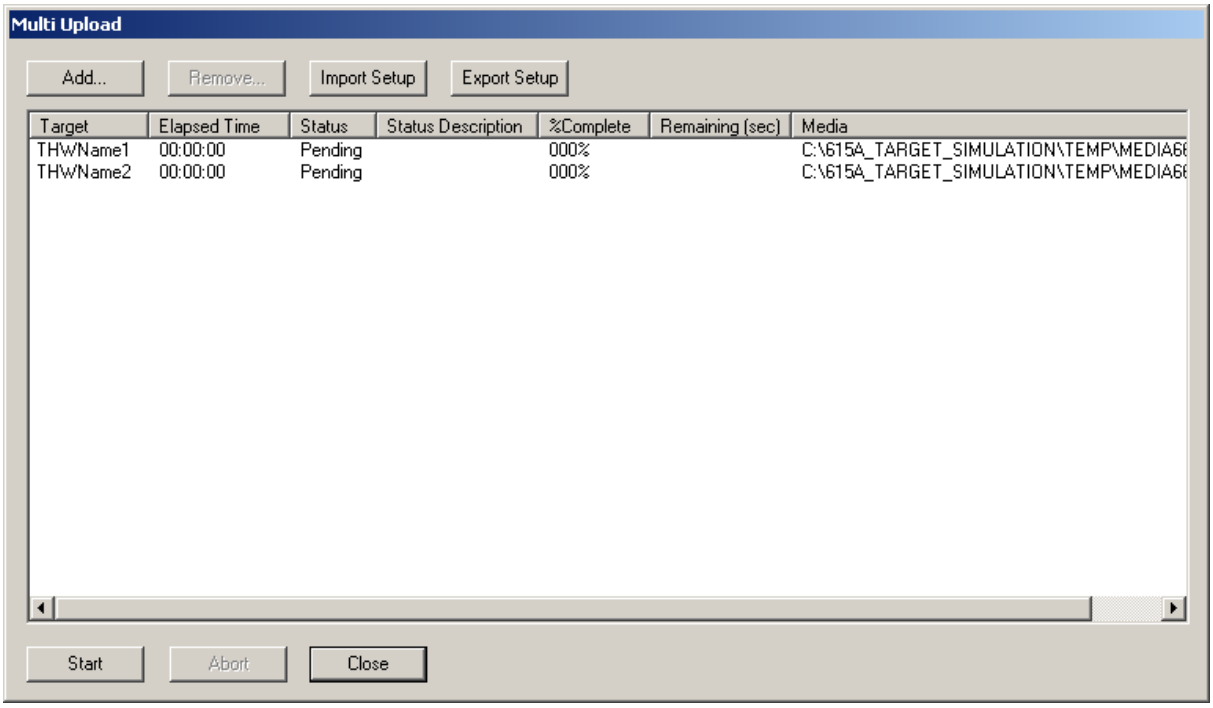
➢ **To Remove load files from the Upload session**

1. Select the Load PN of the load to be removed from the session.
2. Select the **Remove Load** button.

4.3.3 Multi Upload Operation

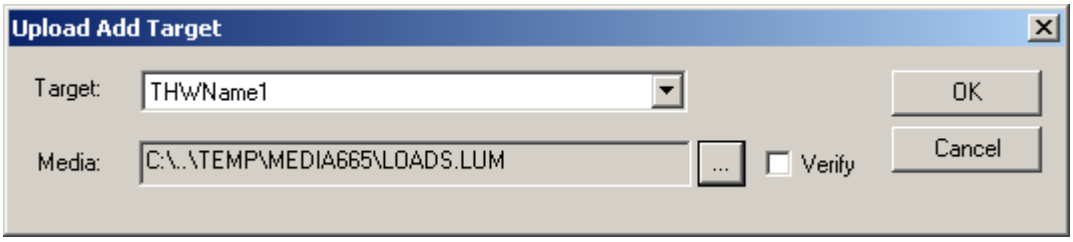
The **Multi Upload Operation** allows you to upload several ARINC665 compatible files from the Data Loader to several AFDX Target Hardware devices from a single user interface dialog. Upload source files can reside on the local host or any accessible storage device on the local area network.

***Note**: To build the ARINC665 compatible Upload Files; LOADS.LUM, FILES.LUM and header file (*.luh), use the 665-MediaSet Builder in A615A-LDR.*



➢ **To Add Targets to the Upload List**

1. Select **Add..**
2. In the **Upload add Target** dialog, select the **Target** via the pull-down menu (Target must be defined in the Target Database)
3. Select the Media button to browse to the media to be loaded to the Target (i.e. CD, floppy, directory) which contains the ARINC665 LOADS.LUM at the root of the media set containing the files to be uploaded.



After the LOADS.LUM is selected, and if the Verify check has been selected, the MediaSet will be verified/validated by A615A-LDR, if an error is found the validation will be aborted and the error/problem will be shown. If the MediaSet can be loaded anyway (maybe only a CRC was not correct), A615A-LDR will ask if the MediaSet should be used although a problem was found. If no errors occurred the "Load List Information" window will list all Header Files (as defined in the associated FILES.LUM file) associated with this load.

- **To Remove Targets from the Upload List**
  1. Select the target to be removed in the Upload List.
  2. Select the **Remove** button.

- **To Upload the Targets**
  1. Select **Start** to start the Multi Upload Operation
  2. The status of the Upload Operations is shown for each Target in the list.
  3. If desired, select **Abort** to stop the Upload operation.

- **To Save the Upload List**
  1. Select the **Export Setup** button.
  2. In the **Save As** dialog specify the file name (*.emu) and select **Save** to save the Upload List to a file.

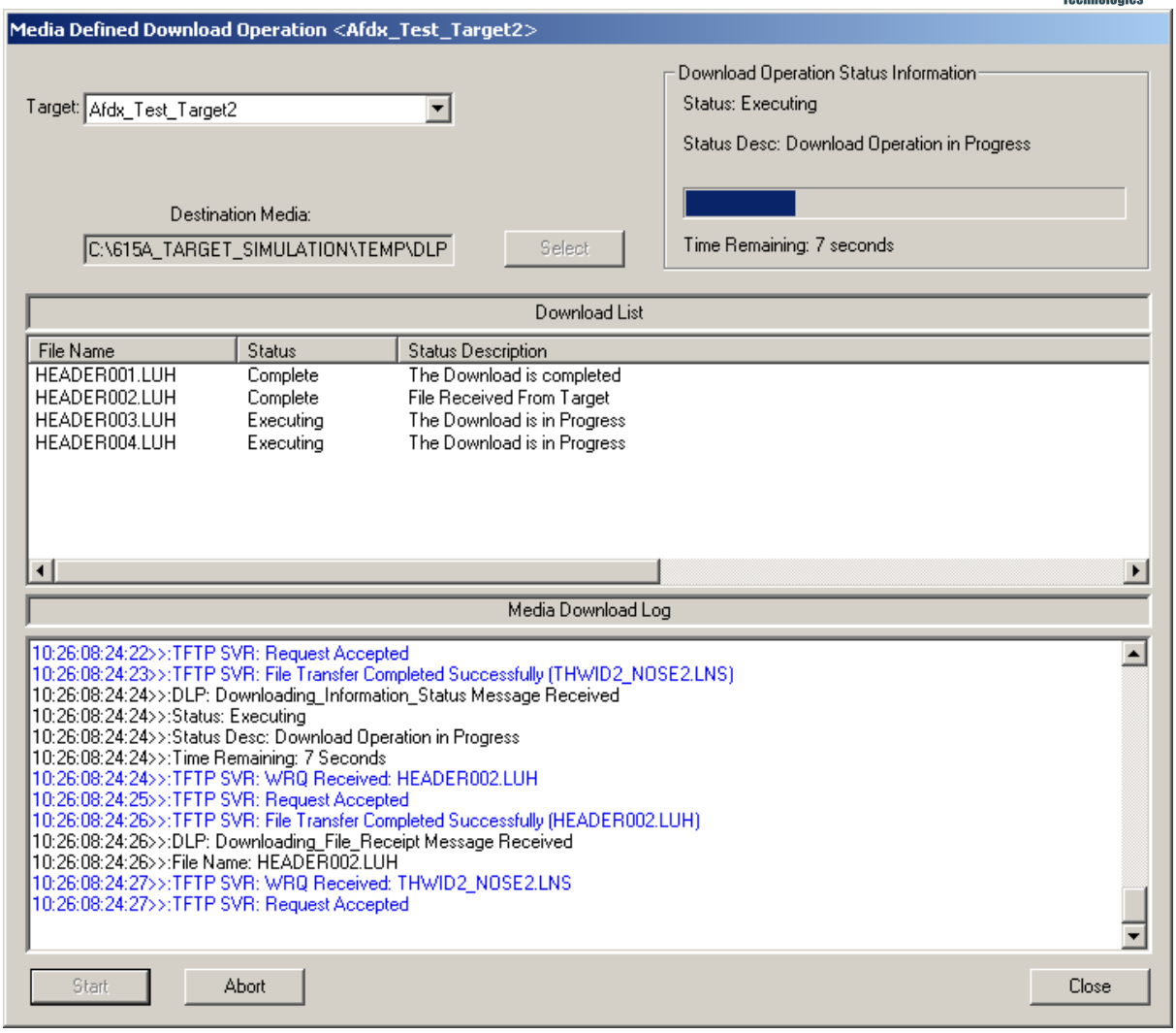
- **To Use a previously saved Upload List**
  1. Select the **Import Setup** button.
  2. In the **Open** dialog specify the file name (*.emu) and select the **Open** button to open the Upload List.

4.3.4 Download Operation - Media Defined

The **Media Defined Download Operation** allows you to download a pre-defined list of Target files from a Target 'End System'. In a Media defined download operation a predefined list of Downloadable files is sent to the Target Hardware prior to download.

- **To Download a pre-defined list of files from a Target**

1. Select **Operations | Media Defined Download** or select the Media Defined Download button.
2. Select the **Target** via the pull-down menu (Target must be defined in the Target Database).
3. Select the **Select** button to browse to the *.LNR file that contains the list of Target files to be downloaded.
   Once selected, the list of files as defined in the *.LNR file will be listed in the Download List window.
4. Select **Start** to begin downloading this list of files from the Target.
   The status of the Download Operation is shown in the Download Operation Status Information window and the status of each file associated with this download is shown in the Download List Information window. All downloaded files are placed in the same directory in which the *.LNR file resides.
5. If desired, select **Abort** to stop the Download operation.

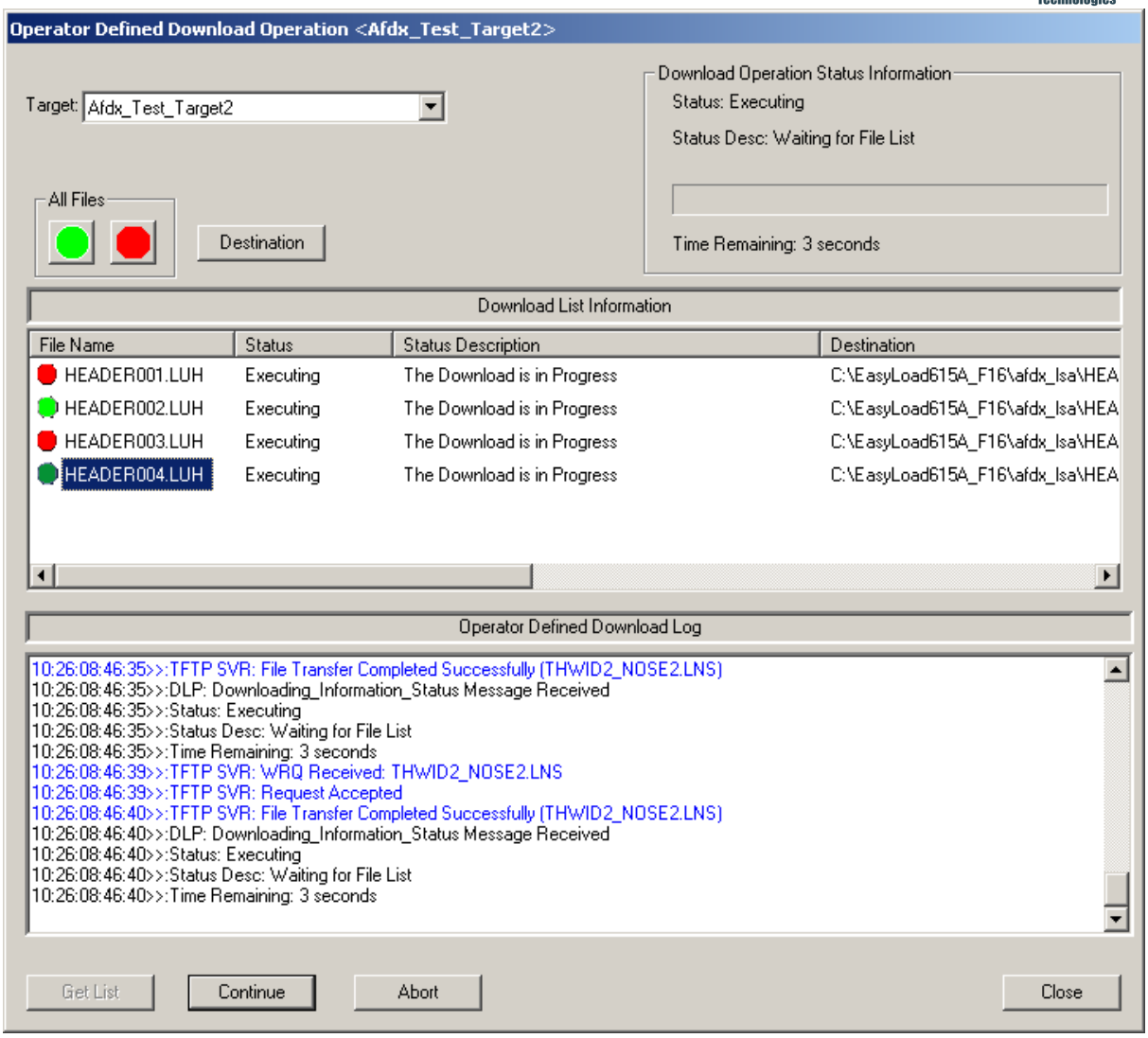

Media Defined Download Operation <Afdx_Test_Target2>
Target: Afdx_Test_Target2
Destination Media:
C:\615A_TARGET_SIMULATION\TEMP\DLP
Select
Download Operation Status Information
Status: Executing
Status Desc: Download Operation in Progress
Time Remaining: 7 seconds
Download List
File Name
Status
Status Description
HEADER001.LUH
Complete
The Download is completed
HEADER002.LUH
Complete
File Received From Target
HEADER003.LUH
Executing
The Download is in Progress
HEADER004.LUH
Executing
The Download is in Progress
Media Download Log
10:26:08:24:22>>:TFTP SVR: Request Accepted
10:26:08:24:23>>:TFTP SVR: File Transfer Completed Successfully (THWID2_NOSE2.LNS)
10:26:08:24:24>>:DLP: Downloading_Information_Status Message Received
10:26:08:24:24>>:Status: Executing
10:26:08:24:24>>:Status Desc: Download Operation in Progress
10:26:08:24:24>>:Time Remaining: 7 Seconds
10:26:08:24:24>>:TFTP SVR: WRQ Received: HEADER002.LUH
10:26:08:24:25>>:TFTP SVR: Request Accepted
10:26:08:24:26>>:TFTP SVR: File Transfer Completed Successfully (HEADER002.LUH)
10:26:08:24:26>>:DLP: Downloading_File_Receipt Message Received
10:26:08:24:26>>:File Name: HEADER002.LUH
10:26:08:24:27>>:TFTP SVR: WRQ Received: THWID2_NOSE2.LNS
10:26:08:24:27>>:TFTP SVR: Request Accepted
Start
Abort
Close

4.3.5 Download Operation - Operator Defined

The **Operator Defined Download Operation** allows you to download files from a Target 'End System'. In an Operator defined download operation the operator is allowed to request the list of the Target's files available for download, then from that list select the files to be downloaded to the host system. The operator can choose the destination location for each file to be downloaded. Data can be downloaded to the local host or any accessible storage device on the local area network.

- **To Download an operator selected list of files from a Target**

1. Select **Operations | Operator Defined Download** or select the Operator Defined Download button.
2. Select the **Target** via the pull-down menu (Target must be defined in the Target Database).
   The **Get List** button is now selectable.
3. Select the **Get List** button to request a list of downloadable files from the Target. Once selected, the list of downloadable files will be received from the Target and displayed in the Download List Information window.
4. Double click on the file(s) you would like to download.
   The red stop sign next to the selected file will turn to a green light to indicate the file has been selected for download.
5. While the file is selected, select the **Destination** button to browse to a location to indicate where you want the file to be downloaded. Perform this step for each individual file selected for download.
6. Once you have selected the file(s) for download, select **Continue** to begin downloading the selected list of files from the Target.
   Once selected, the status of the Download Operation is shown in the Download Operation Status Information window and the status of each file associated with this download is shown in the Download List Information window.
7. If desired, select **Abort** to stop the Download operation.


Operator Defined Download Operation <Afdx_Test_Target2>
Target: Afdx_Test_Target2
Download Operation Status Information
Status: Executing
Status Desc: Waiting for File List
Time Remaining: 3 seconds
All Files
Destination
Download List Information
File Name
Status
Status Description
Destination
HEADER001.LUH
Executing
The Download is in Progress
C:\EasyLoad615A_F16\afdx_lsa\HEA
HEADER002.LUH
Executing
The Download is in Progress
C:\EasyLoad615A_F16\afdx_lsa\HEA
HEADER003.LUH
Executing
The Download is in Progress
C:\EasyLoad615A_F16\afdx_lsa\HEA
HEADER004.LUH
Executing
The Download is in Progress
C:\EasyLoad615A_F16\afdx_lsa\HEA
Operator Defined Download Log
10:26:08:46:35>>:TFTP SVR: File Transfer Completed Successfully (THWID2_NOSE2.LNS)
10:26:08:46:35>>:DLP: Downloading_Information_Status Message Received
10:26:08:46:35>>:Status: Executing
10:26:08:46:35>>:Status Desc: Waiting for File List
10:26:08:46:35>>:Time Remaining: 3 seconds
10:26:08:46:39>>:TFTP SVR: WRQ Received: THWID2_NOSE2.LNS
10:26:08:46:39>>:TFTP SVR: Request Accepted
10:26:08:46:40>>:TFTP SVR: File Transfer Completed Successfully (THWID2_NOSE2.LNS)
10:26:08:46:40>>:DLP: Downloading_Information_Status Message Received
10:26:08:46:40>>:Status: Executing
10:26:08:46:40>>:Status Desc: Waiting for File List
10:26:08:46:40>>:Time Remaining: 3 seconds
Get List
Continue
Abort
Close

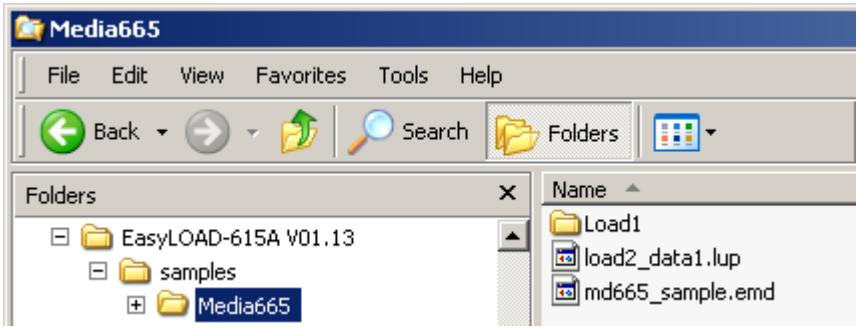
4.4 665-MediaSet Builder

The **A615A-LDR 665-MediaSet Builder** is a scripting tool which can be used to create the LOADS.LUM, FILES.LUM and all header (*.luh) files required for the ARINC615A Upload Operation. The tool also allows the user to specify whether the files created by the 665-MediaSet Builder are in ARINC665-1 or ARINC665-2 format. As an option, the user can perform validation of the entire MediaSet generated including verification of FileExists, numbers, counters, and CRC's.

In summary, the 665-MediaSet Build process is to be performed after you have created the data and support files to be uploaded to the Target in a defined directory structure. A 665-MediaSet Builder script file is then created by the user that references the Target data and support file locations, as well as the Part Number (PN) and Target Hardware ID's on the Target. This script file is then read into the 665-MediaSet Builder to create the LOADS.LUM, FILES.LUM and header files used for the ARINC615A Upload Operation.

To enable the user to better understand the 665-MediaSet Build process, sample media set data and support files are located in:

`c:\Program Files\AIT\A615A-LDR Vxx.xx\samples\Media665`



The Media665 folder and contents can be copied to the C:\ root directory on your computer. The LOADS.LUM, and FILES.LUM and all header files (*.luh) can then be created by selecting **Tools | 665-MediaSet Builder...** then browsing to the following file location:

`c:\Program Files\AIT\A615A-LDR Vxx.xx\samples\Media665\md665_sample.emd`

and selecting **Open**. This starts the 665-MediaSet Builder process. Once the process is complete, the new LOADS.LUM, FILES.LUM and all new header files can be seen in the Media665 folder/subfolders, located in the area specified in the `md665_sample.emd` file.

Follow the steps below to create your own 665-MediaSet.

➢ **To create the LOADS.LUM, FILES.LUM and header (*.luh) MediaSet files**

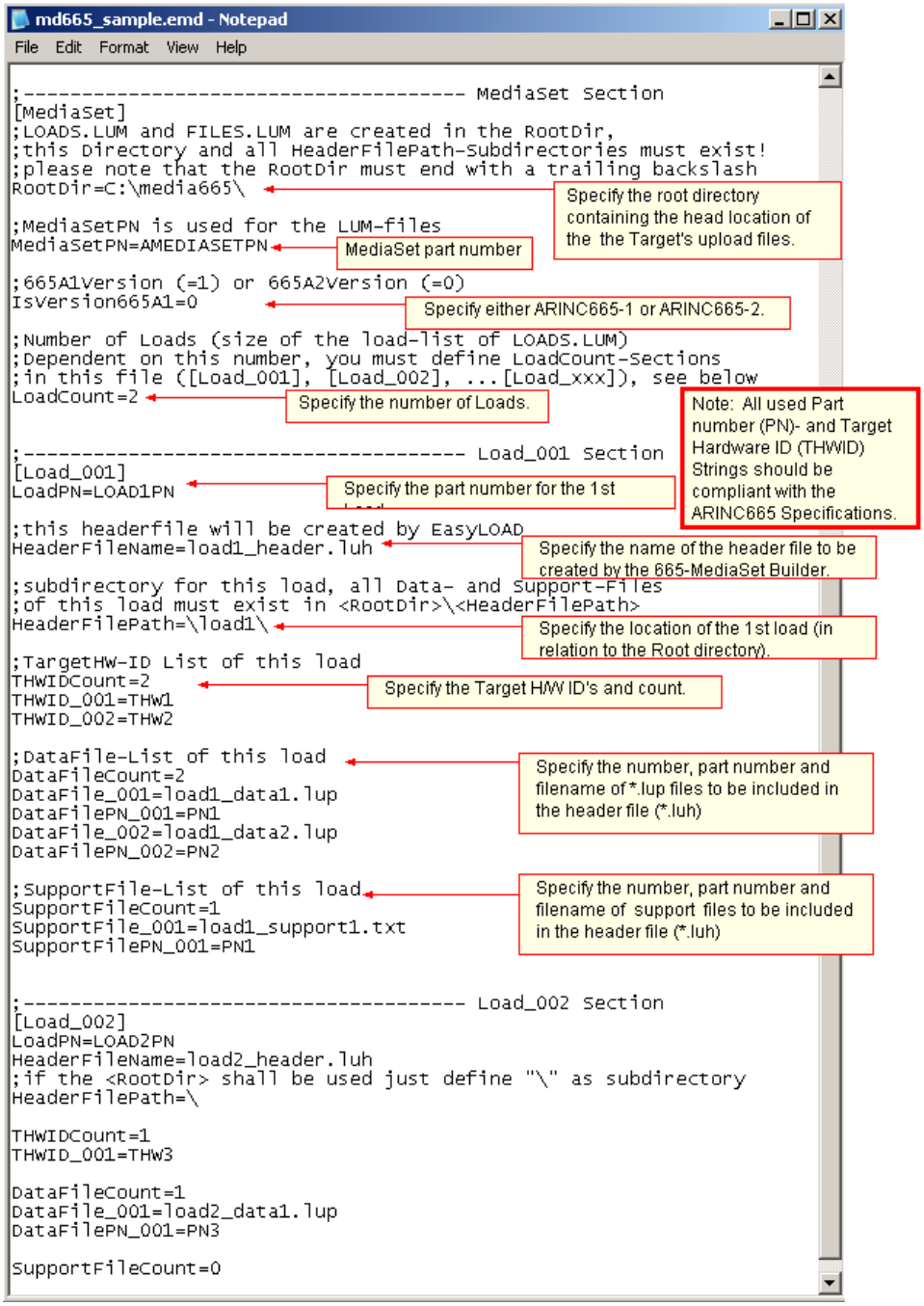
1. Create the Target's data and support files to be uploaded and locate in a directory/folder structure which can be used for the creation of the LOADS.LUM,

FILES.LUM and header (*.luh) MediaSet files.

2. Create a 665-MediaSet Builder script file (*.emd) containing the required information. You can use the `md665_sample.emd` to start with and modify as necessary. The `md665_sample.emd` file is located in

   `c:\Program Files\AIT\A615A-LDR Vxx.xx\samples\Media665\md665_sample.emd`

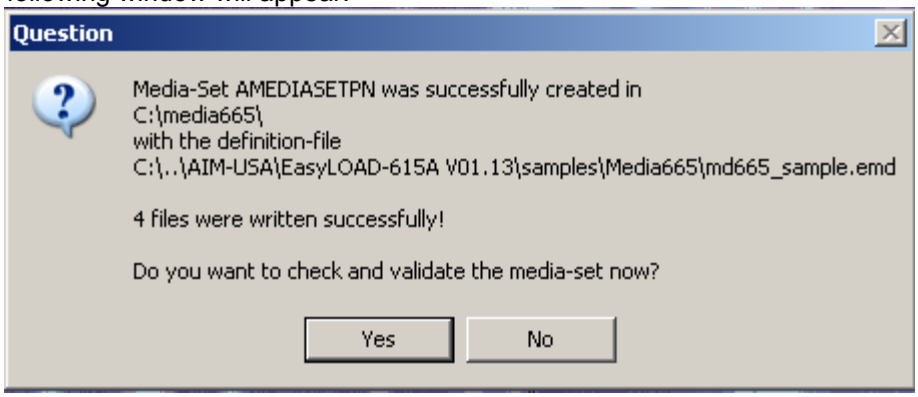
   and shown below:


md665_sample.emd - Notepad
File Edit Format View Help
;---------- MediaSet Section
[MediaSet]
;LOADS.LUM and FILES.LUM are created in the RootDir,
;this Directory and all HeaderFilePath-Subdirectories must exist!
;please note that the RootDir must end with a trailing backslash
RootDir=C:\media665\
Specify the root directory containing the head location of the the Target's upload files.
;MediaSetPN is used for the LUM-files
MediaSetPN=AMEDIASETPN
MediaSet part number
;665A1Version (=1) or 665A2Version (=0)
IsVersion665A1=0
Specify either ARINC665-1 or ARINC665-2.
;Number of Loads (size of the load-list of LOADS.LUM)
;Dependent on this number, you must define LoadCount-Sections
;in this file ([Load_001], [Load_002], ...[Load_xxx]), see below
LoadCount=2
Specify the number of Loads.
Note: All used Part number (PN)- and Target Hardware ID (THWID) Strings should be compliant with the ARINC665 Specifications.
;---------- Load_001 Section
[Load_001]
LoadPN=LOAD1PN
Specify the part number for the 1st
;this headerfile will be created by EasyLOAD
HeaderFileName=load1_header.luh
Specify the name of the header file to be created by the 665-MediaSet Builder.
;subdirectory for this load, all Data- and Support-Files
;of this load must exist in <RootDir>\<HeaderFilePath>
HeaderFilePath=\load1\
Specify the location of the 1st load (in relation to the Root directory).
;TargetHW-ID List of this load
THWIDCount=2
THWID_001=THW1
THWID_002=THW2
Specify the Target H/W ID's and count.
;DataFile-List of this load
DataFileCount=2
DataFile_001=load1_data1.lup
DataFilePN_001=PN1
DataFile_002=load1_data2.lup
DataFilePN_002=PN2
Specify the number, part number and filename of *.lup files to be included in the header file (*.luh)
;SupportFile-List of this load
SupportFileCount=1
SupportFile_001=load1_support1.txt
SupportFilePN_001=PN1
Specify the number, part number and filename of support files to be included in the header file (*.luh)
;---------- Load_002 Section
[Load_002]
LoadPN=LOAD2PN
HeaderFileName=load2_header.luh
;if the <RootDir> shall be used just define "\" as subdirectory
HeaderFilePath=\
THWIDCount=1
THWID_001=THW3
DataFileCount=1
DataFile_001=load2_data1.lup
DataFilePN_001=PN3
SupportFileCount=0

Note: *"User Defined Sections" (as described as an OPTION in the ARINC665-spec) are currently not supported at this time.*

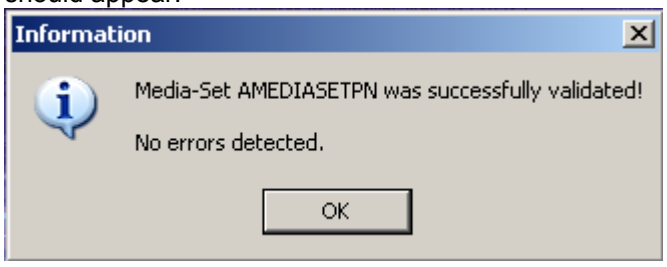
3. Select **File | 665-MediaSet Builder** then browse to the location of your *.emd file you just created and select **Open**.

   This starts the 665-MediaSet Builder process. Once the process is complete, the following window will appear:



   The new LOADS.LUM, FILES.LUM and all new header files (*.luh) can now be seen in the root location/folders specified in your *.emd file.

4. Select **Yes** if you would like to perform verification/validation of the MediaSet. If verification/validation is requested and an error is found, the validation will be aborted and the error/problem will be shown. If no errors occurred - the following window should appear:



5. Select **OK** to complete the process.

4.5 Remote Interface

The **A615A-LDR Remote Interface** is a server process that runs within the A615A-LDR application and allows users to execute data load operations from an external programs. With the Remote Interface enabled, using the Remote Client application included with A615A-LDR, the user can issue a set of commands (via DOS Batch files or Python scripts) instructing the A615A-LDR application to execute various ARINC615A operations.

- **To Enable the A615A-LDR Remote Interface at application start-up:**
  1. In any Text Editor, open the A615A-LDR, INI file (afdx_lsa.ini).
  2. Add the following to the INI file:

```
[REMOTE_IF]
PORT=5150
ENABLE=Y
```

NOTE: *The PORT value should be set to the port on which A615A-LDR shall listen for incoming commands from the remote client. It corresponds to the value used in the -P switch of the Remote Client command described below.*

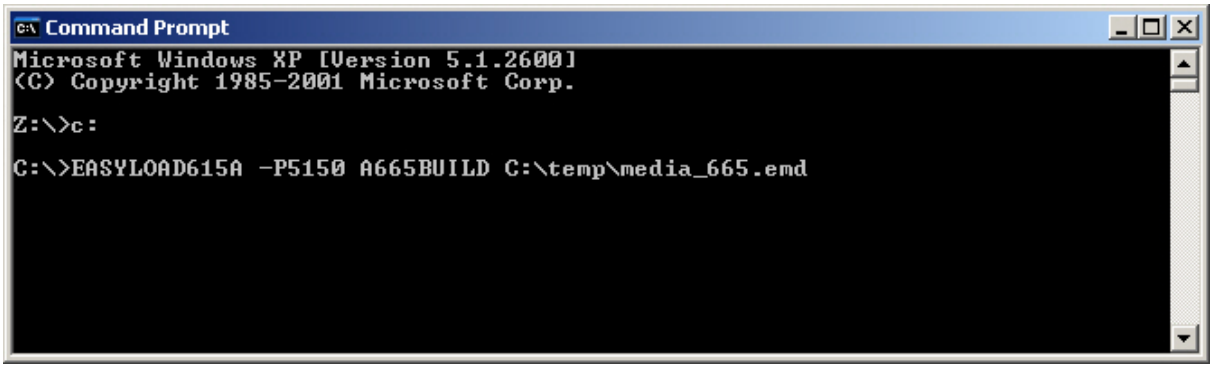
  3. Save the changes to the INI file and close the Text Editor.
  4. Shutdown and re-launch the A615A-LDR application.

- **To Enable the A615A-LDR Remote Interface from application main window:**
  1. Select **Tools | Remote Interface**
  2. Enter the desired PORT to be used by the Remote Interface and then select the **Enable** button.

- **To invoke an operation using the A615A-LDR Remote Client DOS Batch Interace:**
  Invoke the Remote Client command at the Command Prompt using the following syntax:

Note*: The exectuable for the Remote Client command is located at*
..Program Files\AIT\A615A-LDR Vxx.xx
\Remote_Client\EASYLOAD615A.exe

EASYLOAD615A [-H<Host IP>] [-P<Port>] [-L<Log File Path>] <Sub Command>



Examples:
EASYLOAD615A -H192.168.1.40 -P5150 INFO THWID1 TAIL
EASYLOAD615A -P5150 A665BUILD C:\temp\media_665.emd
EASYLOAD615A -P5150 -LC:\LogFiles\MyUploadLogs.log UPLOAD THWID1 TAIL C:\Media665\Loads.lum -V

Optional Parameters:

-H<Host IP>:	The IP Address of the host PC running the A615A-LDR application with remote client interface enabled. If this parameter is not present, then the "local"host is used by default.
-P<Port>:	The Port to be used for communications with the A615A-LDR applicationremote client interface. If this parameter is not present, then port 5150 is used by default.
-L<Log File Path>:	Specifies that the remote client output is to be logged to a file.

Sub Commands:

- **To Build a 665 Media Set**

  A665BUILD <Media Set Path> [-V]

  Media Set Path: Path to the media set build file (.emd)

  -V: Optional, specifies whether or not media set CRCs should be verified after build

- **To Perform an Ethernet Find Operation**

  ETHFIND <IP Addr> <Port> <Time Out>

  IP Addr: IP Destination Address

  Port: Destination UDP Port

  Time Out: Time out in Seconds

- **To Perform an AFDX Find Operation**

  AFDXFIND <THWID> <THWPOS> <Time Out>

  THWID: Target Hardare ID as specified in the target database

  THWPOS: Target Hardware position as specified in the target database

  Time Out: Time out in Seconds

- **To Perform an Information Operation**

  INFO <THWID> <THWPOS>

  THWID: Target Hardare ID as specified in the target database

  THWPOS: Target Hardware position as specified in the target database

- **To Perform an Upload Operation**

  UPLOAD <THWID> <THWPOS> <Loads.lum Path> [-V]

  THWID: Target Hardare ID as specified in the target database

  THWPOS: Target Hardware position as specified in the target database

  Loads.lum Path Full path to the location of the loads.lum file describing the load

  -V Optional, specifies whether or not media set CRCs should be verified

prior to loading.

- **To Perform Multiple Upload Operation**
  MULTIUPLOAD <multiload.emu Path>
  multiload.emu Path: Full path to the location of the *.emu file defining the targets and media to be used for the operation.

Return Value:
The Remote Client commands will return a value of 0 if the operation fails and a value of 1 if the operation successfully completes.

- **To invoke an operation using the A615A-LDR Remote Client Python Interface:**

1. Be sure to update the PYTHONPATH environment variable to point to C:\Program Files\A615A-LDR Vxx.xx\remote_client\
   Note: This can be easily accomplished by runing Setup PYTONPATH.bat located in C:\Program Files\A615A-LDR Vxx.xx\remote_client\

2. From your Python script, or the Python command shell, import the A615A.py module.

```
>>> import A615A
```

3. From your Python script, or the Python command shell, use the A615A_Cmd method to issue the same remote client commands possible in the DOS Batch File interface described above.

```
>>>A615A.A615A_Cmd("MULTIUPLOAD C:\\Temp\\My_Multiload.emu")
```

Note: The usage of the Python Remote Client Interface requires the installation of the Python V2.4.2 interpreter. This can be obtained from www.python.org

5 Definitions

The following topics provide definitions of the used acronyms and terms:

- Acronyms and Abbreviations
- Definition of Terms

5.1 Abbreviations

µsec	microseconds
ACI	AIM's CompactPCI I-Architecture
AFDX	Avionic Full Duplex Switched Ethernet
AMC	AIM's PMC I-Architecture
API	AIM's PCI I-Architecture
API	Application Programming Interface
ARINC	Aeronautical Radio, Incorporated
ASCII	American Standard Code for Information Exchange
ASP	Application Support Processor
BAG	Bandwidth Allocation Gap
BIP	Bus Interface Unit Processor
BIT	Built In Test
BIU	Bus Interface Unit
BSP	Board Support Package
CD	Compact Disc
DLL	Dynamic Link Library
DLP	Data Load Protocol
ES	End System
FCS	Frame Check Sequence
FIND	Find Identification of Network Devices
GTM	Generic Transmit Mode
GTU	Gap Time Unit
I/O	Input / Output
IC	Integrity Checking
ID	Identifier
IFG	Inter-frame Gap
IP	Internet Protocol
MAC	Medium Access Controller
Mbps	Mega bits per second
MCFL	Maximum Consecutive Frames Lost
MSB	Most Significant Byte
ns	nanoseconds
OIN	Open Information Network
OSI	Open System Interconnect
PBI	Physical Bus Interface
PC	Personal Computer.
PCI	Peripheral Component Interconnect
PGWT	Packet group wait time
PMC	PCI Mezzanine Card
PN	Part Number
RFC	Request for Comments
ROM	Read-only memory
S/Q	Sampling & Queuing
SAP	Service Access Point
SNIP	Simple Network Identification Protocol
TFTP	Trivial File Transfer Protocol
TS	Traffic Shaping
UDP	User Datagram Protocol
VL	Virtual Link

5.2 Terms

address quintuplet	The address of an AFDX Comm port which consists of UDP Source/Destination, IP Source/Destination, and MAC Destination address (VL)
Bandwidth Allocation Gap	The amount of time the transmitting device is allocating for the time difference between the start of one frame and the beginning of the next frame transmitted on the port.
Channel	Two physical AFDX ports
FIND protocol	Find Identification of Network Devices (FIND) Protocol allows a client/initiator to dynamically obtain: MAC address IP address Identity and functional characteristics for each available FIND host on the network.
Interframe Gap	Gap between the end of the preceding frame and the current frame.
multicast	Multicast is communication between a single sender and multiple receivers on a network.
Packet Group Wait Time	The time from the transmission start point of the last frame to the start point of the current frame with a resolution of 1us.
Port	One physical AFDX or Ethernet Port
RFC	Requests for Comments (RFCs) form a series of notes, started in 1969, about the Internet (originally the ARPANET). The notes discuss many aspects of computer communication, focusing on networking protocols, procedures, programs, and concepts.
SNIP protocol	Simple Network Identification Protocol (SNIP) allows a client/initiator to dynamically obtain: MAC address IP address Identity and functional characteristics for each available SNIP host on the network. This protocol was renamed to Find Identification of Network Devices (FIND) Protocol in ARINC Report 615A-2 to avoid conflict with other avionics protocols.
Target	Refers to the End System to which the Data Loader is in communication for ARINC615A data loader operations.

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